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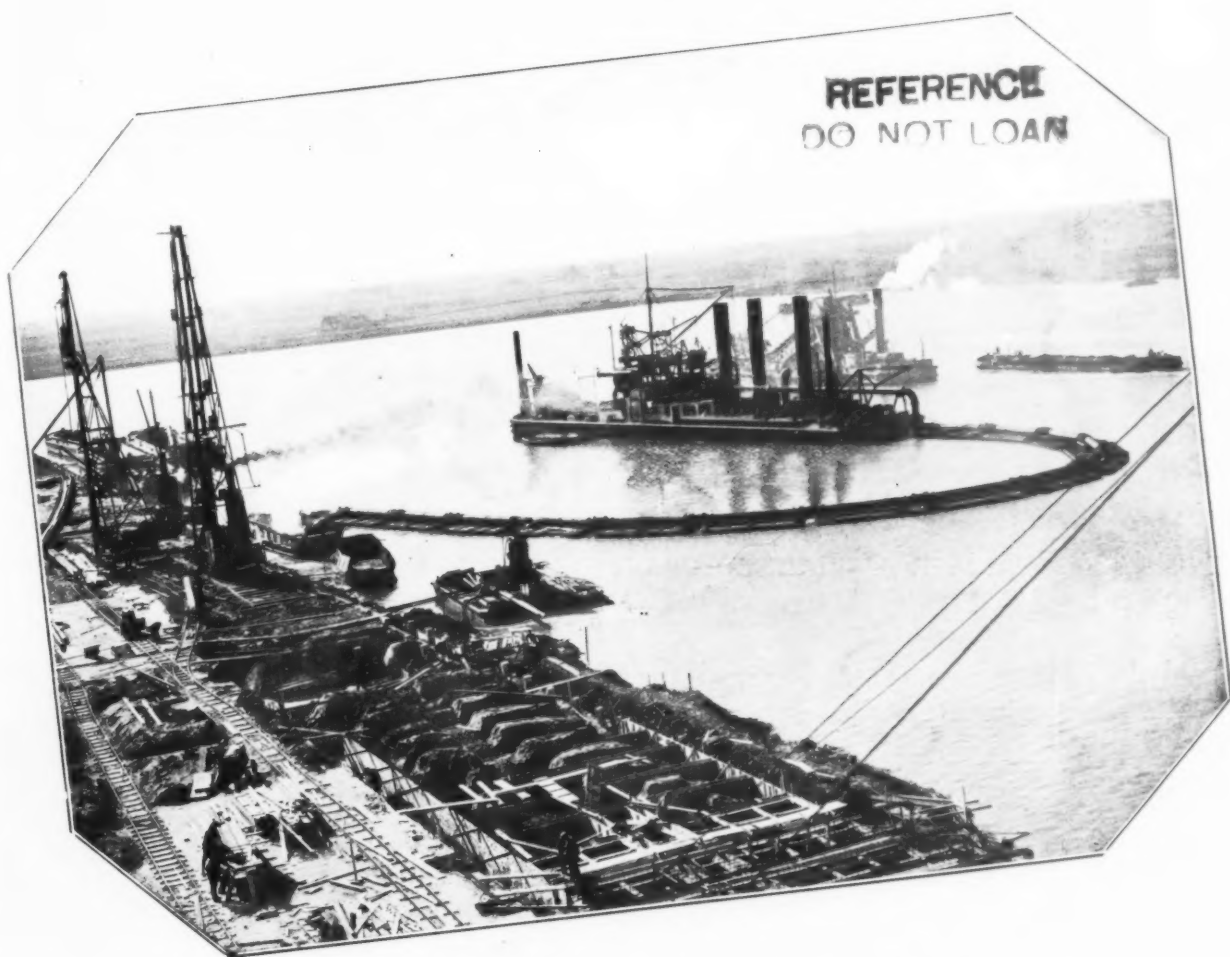


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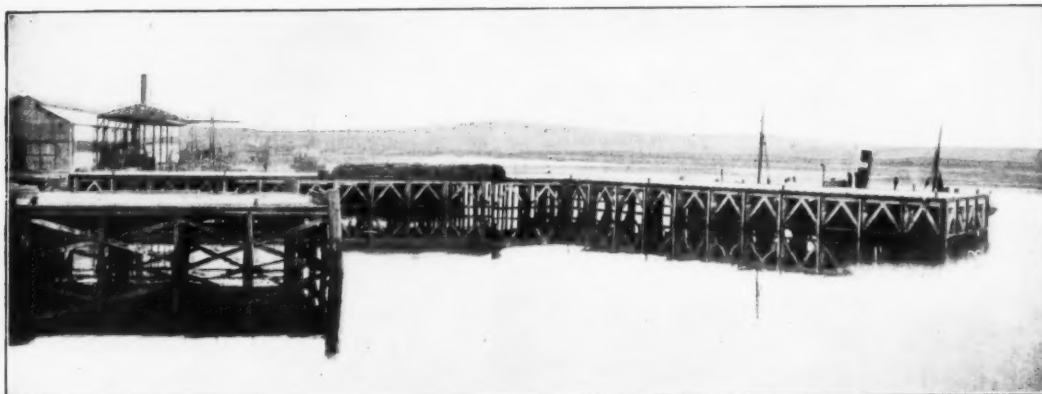
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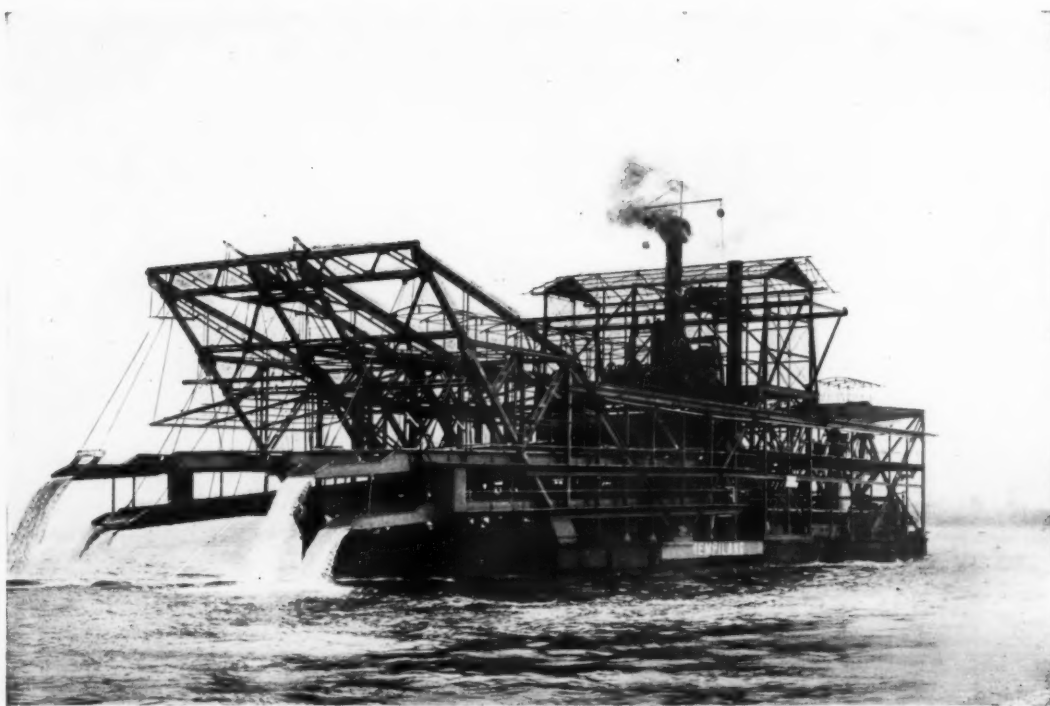
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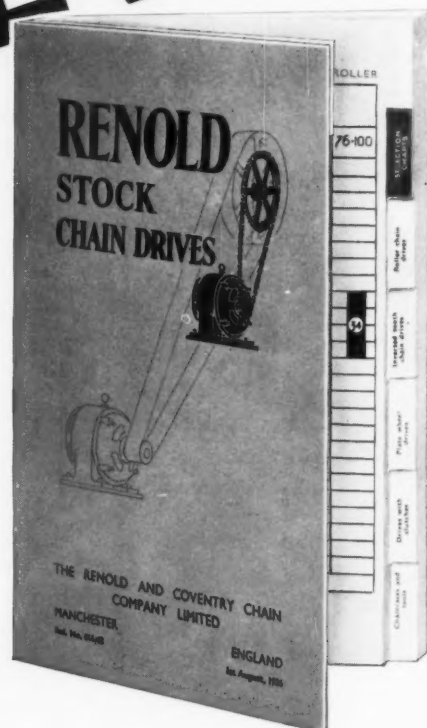
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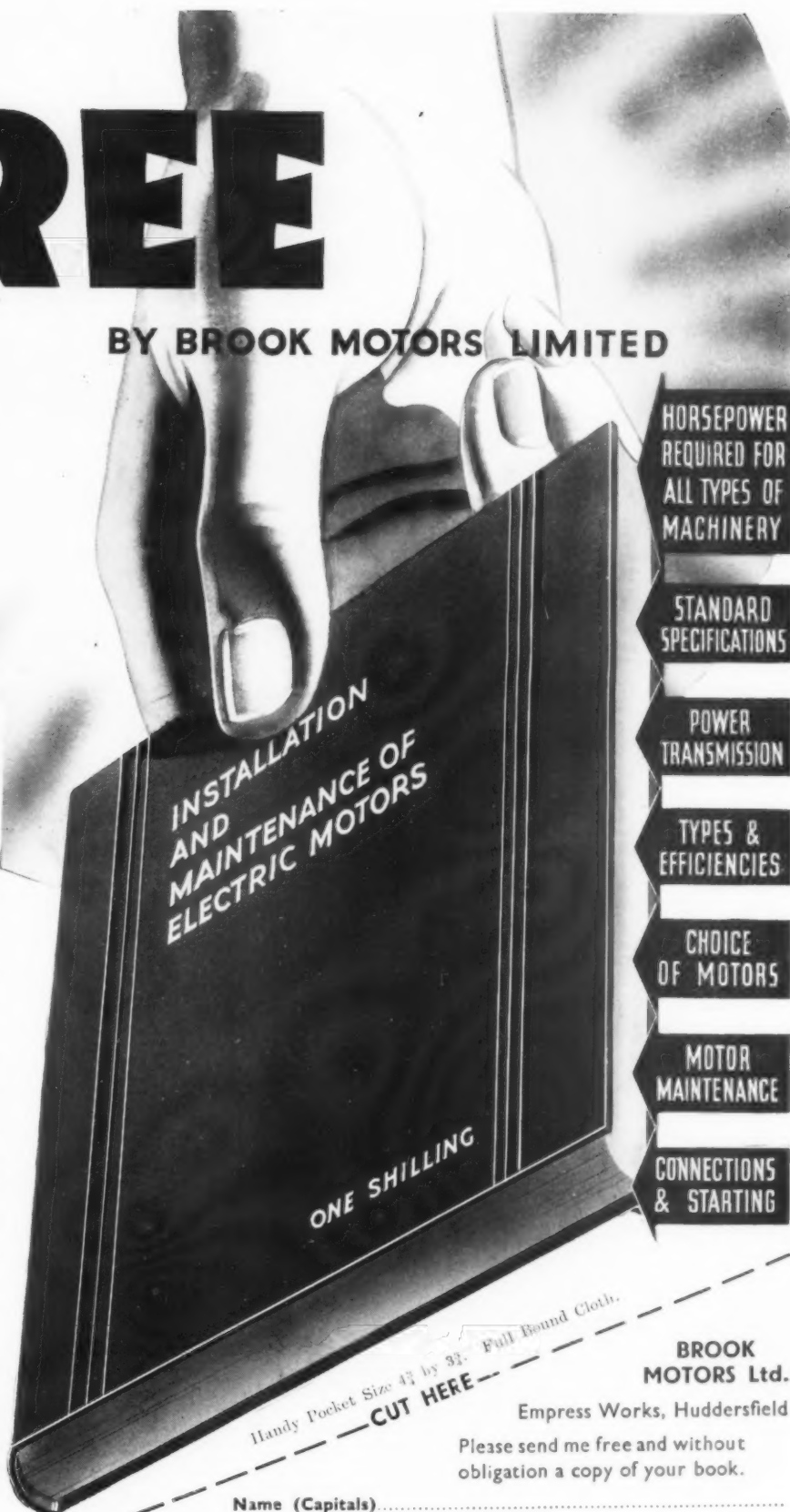
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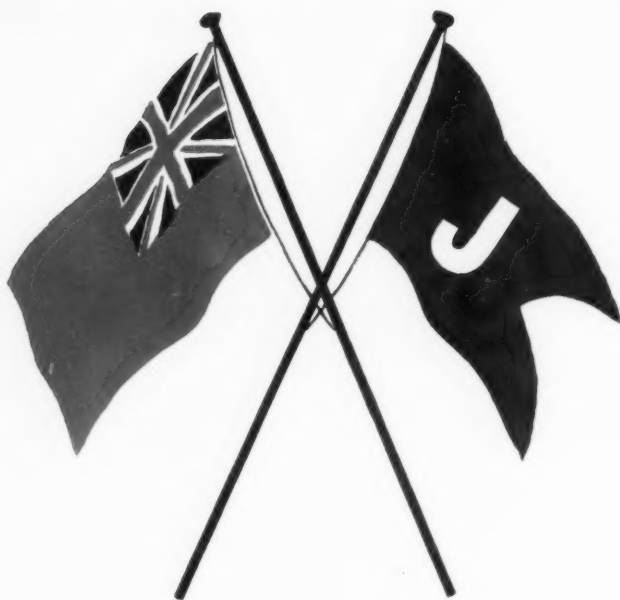
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Contributions which are to be paid for must be clearly marked thus; otherwise they will be considered gratuitous.

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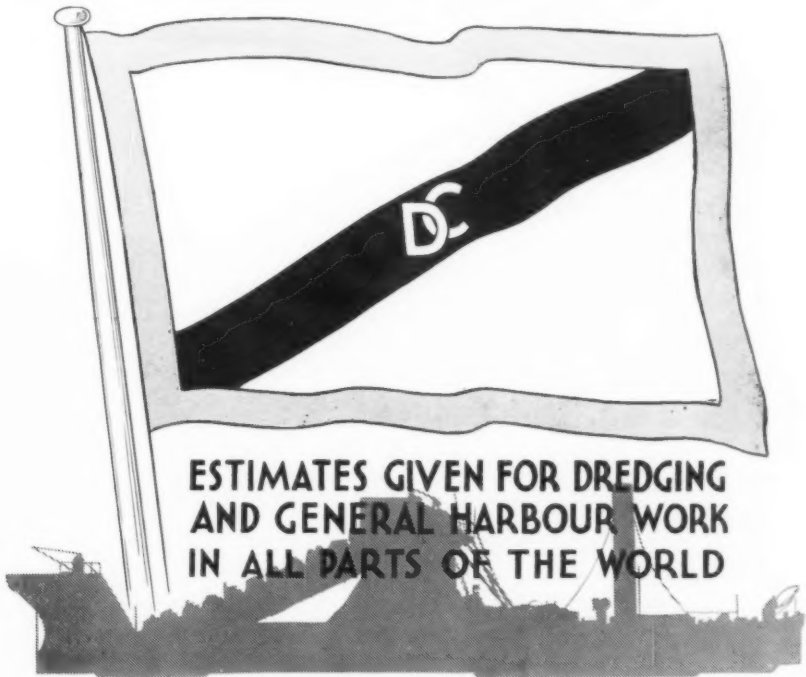
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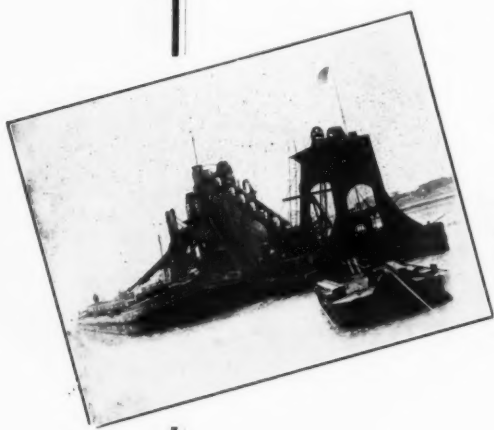


Fig. 1

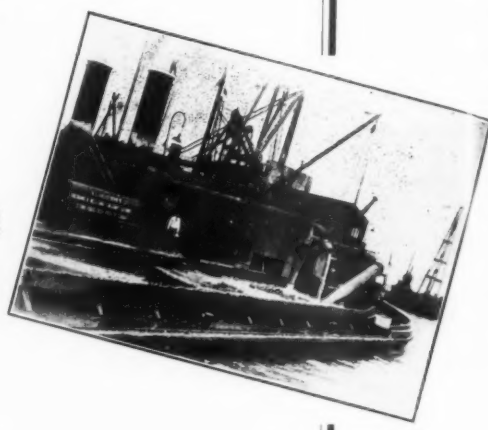


Fig. 2



Fig. 3

The foreshore was dredged as shown in Fig. 1, and the dredgings barged to a floating pump station (Fig. 2), which pumped out the dredgings and forced the material through a 24-in. pipe laid alongside the railway line, under which it passed as shown in Figs. 3 and 4.



Fig. 4

The material which consisted of sand, mud clay and ballast, was finally discharged into a water area (Fig. 5) which has been reclaimed for extension purposes. The total length of the discharge pipe was about half-a-mile.



Fig. 5

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THE DOCK & HARBOUR AUTHORITY

No. 191. Vol. XVI.

SEPTEMBER, 1936

Editorial

Annual Report of the Port of London Authority.

The twenty-seventh annual report of the Port of London Authority for the year ended March 31st, 1936, shows a surplus on the year's working of £6,166.

The total net register tonnage of vessels arriving and departing with cargoes and in ballast for the year ended December 31st, 1935, was 59,762,150, this being an increase of 814,500 tons as compared with 1934, and an increase of 3,282,000 tons as compared with 1933.

The tonnage of imports and exports, foreign and coastwise, for the twelve months ended March 31st, 1936, totalled 40,888,825 tons, this being an increase of 1,604,046 tons, or 4.1 per cent. as compared with the previous year. There was an increase both in imports and exports, the import figures being 33,648,623 tons, or an increase of 951,702 tons, or 2.9 per cent. as compared with 1935. Exports totalled 7,240,202 tons, or an increase of 652,344 tons, or 9.9 per cent. over the previous year.

The result of the year's working, as mentioned above, shows a surplus of £6,166 after deducting interest charges from the balance of revenue. The total revenue received was £5,668,279, this being an increase of nearly £220,000, as compared with the previous year, and the total expenditure was £4,082,354, this being an increase of £124,000 over the previous twelve months. The balance of revenue over expenditure on the year's working was £1,585,925, which, after deducting interest on port stock and temporary loans, sinking fund charges, etc., less interest, etc., receivable, which amounted to £1,579,759, left a surplus of £6,166 on the year.

New Type of Bridge over River Liffey, Dublin.

While the Dublin Port and Docks Board are conscious of their obligations under the Dublin Port and Docks (Bridges) Act 1929, to erect a bridge over the River Liffey east of Butt Bridge, it has been unanimously decided by the Board that further consideration of the matter should be postponed until at least an outline of the Town Planning Scheme now in contemplation is available.

It is also the opinion of the Dublin Port Board that the type of bridge set out in the Act is not as suitable as can be obtained in view of recent developments of bridge construction, and that an alternative type of bridge will require to be considered when the matter comes up for final review.

This decision was reached after a conference of the Special Sub-Committee, with representatives of the Corporation of Dublin and the Dublin Co. Council.

Manchester Ship Canal.

Good traffics for the month of July are reported by the Manchester Ship Canal Company. The approximate receipts were £106,200, representing an increase of £6,198 on July, 1935. The figures for the first seven months of 1936 are eminently satisfactory. The total for January-July is £757,165, as against £725,446 for the same period of 1935. These figures reveal how substantial has been the trade recovery. Equally satisfactory are the traffic returns of the Port of Liverpool.

Shipments of Coal and Coke from the Humber Ports.

The shipments of coal and coke (cargo and bunkers, foreign and coastwise) at the Hull docks this year to August 1st were 1,203,889 tons as compared with 1,457,732 tons—a decline of a quarter of a million tons—in the corresponding period of 1935. At Grimsby in the same seven months the total shipments were 640,804 tons, as against 688,331 tons, and at Immingham 975,060 tons as against 1,120,122 tons. The

quantity of coal only exported from the Humber ports (Hull, Goole, Grimsby and Immingham) to places abroad during the seven months was 1,668,210 tons as compared with 1,924,040 tons and from Boston and Lynn 103,476 tons as against 117,417 tons. In every direction, it will be noted, there was a decline in the quantity handled by the appliances at the various ports. The principal cause was the shrinkage in the exports.

The imports of wheat and kindred cereals at the Hull docks in the seven months to July 31st amounted to 735,290 tons as compared with 621,410 tons in the corresponding period of 1935. Imports of oilseeds, nuts and kernels, however, did not reach the level of a year ago, the total being 380,000 tons as against 420,000 tons. Imports of timber were no less than 719,270 loads, compared with 463,613 loads, an increase of over a quarter of a million loads. The largest increase was in hewn timber, viz, 163,583 loads, that of sawn wood being 92,075 loads. Although there has been some congestion at the Victoria Dock, delays have been reduced to a minimum thanks to good organisation and willing workers. Imports of petroleum during the period exceeded 86 million gallons and nearly 10 million gallons less than at the same date in 1935.

Increase in Southampton Docks Statistics for first Six Months of 1936.

Recently published figures show that the progress made in Southampton Docks traffic in the first six months of the year was appreciable.

Improved import and export traffics resulted in an additional 61,000 tons of freight being handled over the quays during the first half of the year, compared with the corresponding period of 1935. This advance represented an increase of 13 per cent. in the total cargo trade.

Other branches of the shipping trade also revealed favourable comparison with the levels attained in the previous year. The quantity of shipping tonnage entering the docks increased by 8 per cent. to 8,477,661 gross tons, while the number of passengers embarking and disembarking was greater by 7 per cent.

Southampton claimed a full share of the enhanced North Atlantic passenger traffic this year, and this accounts largely for the increase.

The Port of Aarhus, Denmark.

The Port of Aarhus is becoming one of Denmark's most important. It has undergone great expansion during the last 100 years. From being a few bulwarks at the river mouth in 1830, it has grown to take up two miles of the coast line. The aggregate length of its quays is 6.2 kilometres. There are 56 hectares of land surface and 42 of water surface in the harbour, varying in depth up to 10 metres. The plant of the port is worth nearly 20 million Kroner. 6,035 vessels, totalling 1.6 million tons, called at Aarhus in 1935, and the cargoes handled amounted to 1.6 million metric tons. This represents an advance of 3,050 ships and of 1.1 million tons upon the traffic of the harbour in the year 1900. The cargo traffic also has risen by over one million tons. Apart from the increased capacity of the harbour resulting from quay extensions, five silos have been built to hold 113,000 cubic metres of cargo, supplied by fourteen pneumatic discharge plants with capacities ranging from 35 to 120 tons per hour. The past 35 years have also seen the erection of 14 electric cranes of 1.5 to 25 tons, and nine coal-dischargers capable of handling 60 to 100 tons per hour each. A further large expansion is at present being effected at Aarhus, according to a working plan put forward in 1933. This will take seven years to carry out, and the estimated cost is 7.5 million Kroner.

News from all Quarters

France

ARRIVALS at the harbour of Marseilles in June came to 570 ships of over 1.1 million tons' displacement. Of these vessels 381 were French, 47 British, 37 Italian, and 31 Spanish. Smaller numbers came from Holland, U.S.A., Germany and Japan.

Whilst the new agreements on wages and conditions are working smoothly in most French ports, this is not so in Bordeaux. Relations between employers and workers are so strained that the slightest disagreement results in fresh strikes. The business of the port has been seriously damaged. The Maritime Federation of Bordeaux accuses the dockers of breach of contract, especially on the question of overtime. Since the dockers will work only from eight till twelve and from two till six, overseas travellers are constantly missing their train connections and having to wait one or two days in the port for their luggage to be unloaded. The regular service to Morocco is no longer reliable, as it often happens that the s.s. "Mexique," which has to start on schedule, sails with half the goods it has brought to Bordeaux still on board, leaving about 140 tons of French export goods on the quay. On one occasion the dockers refused to handle the last 500 sacks remaining on an 8,000-ton cargo steamer after six o'clock on a Saturday, thereby holding the ship in port until Monday morning. The "go slow" practice, than which nothing can be more harmful to business, has also caught the fancy of the men. One foreign firm, infuriated at having to let its ships put to sea half loaded, has declared that it will not use the harbour of Bordeaux at all in future. These and many other complaints are made by the Maritime Federation in an open letter to the press. They imply that unless the situation improves from now onwards, the port will be ruined.

Egypt

The harbour of Alexandria was visited by 840 ships during January-April, 1936, a rise of just 100 upon the corresponding 1935 figure. The British flag topped the list with 244 ships, followed by Italy with 91, Germany with 48, the U.S.A. with 38, and France with 37. The traffic of Port Said, on the other hand, has declined between the first halves of 1935 and 1936 respectively, from 1,555 ships totalling 7.9 million r.t. to 1,383 totalling 7.0 millions.

Greece

Interesting figures are to hand, showing the development of the Greek ocean-going cargo fleet. It has been aided by a number of factors—an expansion in tonnage, the better value of shipping and the greater volume of business; also the favourable trading arrangements with Britain fixing minimum freight-rates, the slow but sure increase of the latter, fewer losses at sea, and the greater yield of invested capital. During 1935 the tonnage of Greek trading vessels

rose by 70,526 tons, reaching 1.88 millions. Greece now takes ninth place in the world, immediately preceded by Holland.

It was in the second half of 1935 that the chief rise took place in the value of shipping. That of the Greek cargo fleet was put at £3.5 millions in 1934, and at 4.55 millions in 1935—a dramatic advance for any single year. The number of Greek ships laid up in 1932 was 103, with a tonnage of about 391,000; by 1935 these figures had sunk to 40 ships and 122,400 tons. Thirdly, the Anglo-Greek freightage agreement of last year not only helped the Greek owners financially, but denoted the revival of British confidence in Greek shipping. The fleet was thereby linked more closely than before to British commerce.

In 1934 nine Greek ships went down with total loss, but in 1935 there were only six such disasters, of which three were small coastal vessels. The gross takings for these two years, moreover, totalled £7.57 and 7.75 millions respectively.

But in spite of the numerous encouraging factors, it must be remarked that nearly one-third of the ships in the Greek mercantile fleet are over 25 years old, and only 2.5 per cent. are less than 10 years old.

Finland

The extension of the Finnish Port of Hertonas, near Helsingfors, is in progress. The building plan envisages a total expenditure of 60 million Finnish marks. The municipality of Helsingfors has already sunk more than 40 millions in quays, railways and roads under this scheme. A new oil-storage plant is finished, also railway lines and several new roads to the harbour. A railway bridge connecting Vanda and Aggelby is complete, except for its middle section of 54 metres, which will be put in place as soon as the lumber-floating season is over.

Denmark

The new "petrol port" of Copenhagen has been constructed in record time. Work was started about May 1st, and by putting on three shifts the builders had the new plant ready by August 1st. Messrs. Alfred Olsen and Company have had four big oil bunkers erected at a cost of about one million Kroner. A fifth tank is in course of construction. The new quay was actually in use by August 1st, when two tankers made the first call, discharging petrol and paraffin. Despite the speed of the erection, not a single "sweating" nut was discovered.

The bunkers are situated on an old fortress connected with the mainland by a concrete railway bridge. The quay of 140 metres is of concrete, and the tanks are surrounded by protective concrete walls. The depth of water at the quay is nine metres, so that tank vessels up to 10,000 tons gross may call fully loaded. In planning the bunkers, special precautions were taken against fire. The engineers have equipped the plant with an ingenious system of foam sprinklers; each tank is completely enveloped in the pipes of this system.

The Port of Karachi.

In the month of May, 1936, 74 vessels with a net registered tonnage of 187,526 entered the Port of Karachi, and 76 vessels cleared of 192,269 n.r.t. The number of vessels which entered and cleared during May, 1935, were:—Entered 72 vessels of 190,447 n.r.t., and cleared 71 vessels of 182,611 n.r.t.

For the two months April-May, 1936, the number of vessels entering the Port of Karachi amounted to 156 of 400,698 n.r.t., and clearances amounted to 157 vessels of 400,519 n.r.t. During the two months April-May, 1935, 153 vessels entered of 397,616 n.r.t. and 151 vessels cleared of 396,132 n.r.t. The above figures do not include country craft.

The amount of cargo handled in May, 1936, was:—Imports 68,123 tons and exports 81,244 tons, a total of 152,367 tons of cargo. In the month of May, 1935, 59,303 tons of imports and 81,351 tons of exports were handled, a total of 140,657 tons. For the two months April-May, 1936, imports amounted to 132,759 tons and exports 180,864 tons, a total of 313,623 tons. During the two months April-May, 1935, imports were 128,621 tons and exports 161,580 tons, a total of 290,201 tons.

Port of Rotterdam.

The Chamber of Commerce and Industry of Rotterdam has issued the statistics concerning the movement of sea-going ships in the New Waterway, and which are as follows:—

During July, 1936, 1,078 ships of 1,757,898 n.r.t. entered the Port of Rotterdam, as compared with 920 ships of 1,552,361 n.r.t. during July, 1935. The number of ships entering for the small ports in the environs were 208 of 400,186 n.r.t., as compared with 222 ships of 421,645 n.r.t. in July, 1935.

For the first seven months of the year, January to July, 1936, 7,166 ships of 11,728,412 n.r.t. entered the Port of Rotterdam, as compared with 6,298 ships of 10,260,700 n.r.t. in the corresponding period of 1935. The number of ships entering for the small ports in the environs of Rotterdam during the first seven months of 1936 were 1,432 of 2,965,302 n.r.t., as compared with 1,397 ships of 2,808,878 n.r.t. in the corresponding period of 1935.

After deducting the number of ships counted more than once in the different ports, the number of entrances in the month of July, 1936, amounted to 1,228 vessels of 1,988,219 n.r.t., as compared with 1,088 ships of 1,838,946 n.r.t. in July, 1935. For the first seven months of 1936, the total entrances were 8,123 vessels of 13,379,462 n.r.t., as compared with 7,278 ships of 11,936,130 n.r.t. in the corresponding period of 1935. These figures are for the whole region of the Port of Rotterdam with its environs, comprising the delta formed by the mouths of the Rivers Rhine and Meuse.

Pier Works at Southport.

Southport Corporation proposes to demolish the length of the pier seaward of the old pierhead and to put the remainder of the pier into good repair, order and condition at an estimated cost of £9,700.

Change of Address.

Cousland and Browne, Ltd., Timber Importers, have moved to Granite House, 97/101, Cannon Street, London, E.C.4. Their new telephone number is MANsion House 6262 (4 lines), and telegraphic address—Weseltimba, Cannon, London.

The Port of Colombo

Liquid Fuel Imports.

The quantity of liquid fuel imported at Colombo during June, 1936, amounted to 18,549 tons, as compared with 27,754 tons in June, 1935. For the first six months of 1936, 157,830 tons of liquid fuel were imported, as compared with 167,405 tons in the corresponding period of 1935.

Liquid Fuel Bunkers supplied to Steamers.

Liquid fuel bunkers supplied to steamers in June, 1936, was 44 ships bunkered with 23,854 tons of liquid fuel, as compared with 40 ships with 20,461 tons in June, 1935. For the first six months of 1936, the total number of ships bunkered was 268 with 131,558 tons of liquid fuel, as compared with 255 ships with 135,104 tons for the corresponding period of 1935.

Coal Imports.

The quantity of coal imported during the month of June, 1936, was 24,366 tons, as compared with 29,321 tons in June, 1935. Altogether 226,744 tons of coal were imported during the first six months of 1936, as compared with 221,742 tons in the corresponding period of 1935.

Coal Bunkers supplied to Steamers.

The number of steamers bunkered during June, 1936, was 60 with a total of 17,987 tons of coal, as compared with 58 steamers with 18,175 tons in June, 1935. During the first six months of 1936, 411 steamers were bunkered with 121,259 tons of coal, as compared with 436 steamers with 129,739 tons in the corresponding period of 1935.

Number and Tonnage of Vessels Entered and Cleared.

The number and tonnage of vessels other than country craft engaged in trade, which entered and cleared at the Port of Colombo during June, 1936, and the first six months of this year, with comparisons for 1935 and 1934 is as follows:—

		Vessels engaged in Foreign Trade	Tons	Vessels engaged in Coasting Trade	Tons
(a) Entered during June, 1936	...	210	986,474	5	9,277
" " " 1935	...	206	930,425	5	15,155
" " " 1934	...	213	943,704	4	10,165
During the six months ended June, 1936	...	1,321	6,166,512	31	73,424
During the six months ended June, 1935	...	1,345	6,162,910	24	68,152
During the six months ended June, 1934	...	1,314	6,033,427	22	63,971
(b) Cleared during June, 1936	...	207	980,618	3	6,963
" " " 1935	...	203	926,472	2	5,062
" " " 1934	...	212	942,359	2	8,146
During the six months ended June, 1936	...	1,333	6,301,416	19	58,901
During the six months ended June, 1935	...	1,361	6,208,997	12	41,285
During the six months ended June, 1934	...	1,328	6,060,875	16	58,874

Tonnage of Imports and Exports.

The tonnage of imports and exports at the Port of Colombo during June, 1936, and the first six months of this year, together with comparisons for 1935 and 1934, is as follows:—

	1934	During June 1935	1936
	Tons	Tons	Tons
Imports (excluding Coal and Oil)	83,310	75,638	80,819
Exports (" ")	68,035	49,789	46,254
Total	151,345	125,427	127,073

	During the six months ended June 1934	1935	1936
	Tons	Tons	Tons
Imports (excluding Coal and Oil)	512,354	512,239	534,997
Exports (" ")	367,276	277,177	258,947
Total	879,630	789,416	793,944

Oil Facilities Receipts.

The oil facilities receipts for June, 1936, were Rs.60,178, as compared with Rs.93,224 during June, 1935. The total receipts for the first six months of 1936 were Rs.501,421, as compared with Rs.552,706 for the corresponding period of 1935.

Port of Southampton Topics

Docks Statistics for July show Decreases on Last Year.

Southampton Docks statistics for July show considerable reductions compared with the figures for July last year. But this does not mean decrease in the general trade of the port. The explanation is that in July, 1935, the port was used to a very large extent by vessels taking passengers to see the Naval Review in Spithead, and as a result the figures for that month were very much higher than they otherwise would have been.

The decreases recorded now in comparison with last year's figures do not, therefore, give any real indication of the port's activities. Compared with other months this year, they indicate that the port is reaping substantial benefit from the improved shipping position, particularly from a passenger viewpoint.

The number of vessels entering the port during July was 305, and the number leaving 312, decreases of 53 and 45 respectively, compared with the returns for July, 1935. The number of tenders entering the port, and also leaving it, was 72, an increase of five, compared with the tender figure of a year ago.

Gross tonnage inward amounted to 1,906,974 tons, and outward to 1,979,155 tons, decreases respectively of 232,427 tons and 159,407 tons. The net tonnage figures were:—Inward 1,013,583 tons and outward 1,054,196 tons, which were respectively decreases of 123,571 tons and 79,145 tons.

While inward cargo showed a decrease of 11,116 tons—from 82,050 tons in July, 1935, to 70,934 tons—there was an increase of 8,483 tons in the exports, which rose from 29,559 tons to 38,042 tons.

Passengers naturally numbered fewer than in the "boom" month of last year. The total arriving during July was 47,847, and the number departing 50,542. In July last year the totals were 55,303 and 53,553.

Union Castle Line's Faster Service.

The accelerated mail and passenger service between Southampton and South Africa began on August 21st, when the Union Castle Line's new motor ship, "Stirling Castle," set out with the object of reaching Cape Town in 13 days 11 hours.

If she achieves this, then the 43-years-old record set up by the famous "Scot" will be eclipsed. The "Scot's" record time for the outward journey was 14 days 18 hours 57 minutes.

The "Stirling Castle," however, will not be out for records, despite the fact that she hopes to get them, for the reduced time of passage is based upon the schedule which all the ships in the fleet will eventually have to maintain.

The accelerated schedule will straight away take in the "Athlone Castle," sister ship to the "Stirling Castle."

The other five vessels in the mail fleet will continue to make the passage in 16 days 11 hours as at present, until they are re-engined.

During the re-engining of the "Arundel Castle" and "Windsor Castle" the intermediate motor-ships, "Dunvegan Castle" and "Dunottar Castle," will be brought into the mail service.

It is interesting to recall that when the first mail contract was awarded to the old Union Line in 1857 the agreement provided that the duration of the passage should not be more than 42 days each way.

The vessels then called at St. Helena and Ascension. Five ships were employed on the service, and the first sailing was made by the "Dane," which left Southampton on September 15th, 1857. She occupied 44 days on passage.

Busy Days for North Atlantic Traffic.

The big ships of the North Atlantic have been kept very busy in recent weeks dealing with the large number of passengers who, every year about this time, are making the ocean crossing.

The "Berengaria" has been laid-up for a few weeks, and the "Queen Mary" and the "Aquitania" have been maintaining the weekly express sailing schedule of the Cunard White Star Line. The "Aquitania," particularly, has had to hustle as she is several knots slower than the "Queen Mary." Even when the "Berengaria" is back from the end of August onwards, there will still be no rest for the big ships until the end of the American rush home at the end of September.

The "Queen Mary" continues to be a remarkable magnet when in docks, and even when her time in port is short there are huge crowds anxious to inspect her. Since the "Queen Mary's" first arrival at Southampton on March 27th, over 200,000 people have passed into the docks or gone by river excursions to view her. In addition, 45,000 school children have gone over the liner in organised parties. A car-park opened near the "Queen Mary's" berth has been used by over 25,000 cars.

Aden Port Trust

The following are the returns of shipping using the Port of Aden for the month of June, 1936:—

	No.	Tonnage
Merchant Vessels over 200 tons ...	146	581,432
" " under 200 tons ...	3	486
Government Vessels ...	13	31,144
Dhows ...	68	2,555
PERIM.		
Merchant Vessels over 200 tons ...	2	5,272

The total value of imports, excluding Government Stores, was Rs.55,87,000/-, as compared with Rs.54,07,000/- for June, 1935, and of exports Rs.29,06,000/-, as compared with Rs.35,27,000/-.

The total value of both imports and exports together was Rs.84,93,000/-, as compared with Rs.89,34,000/- for the corresponding month last year.

Imports during the month were above those for June, 1935, in the case of raw hides, raw skins, grey and white piece-goods and unmanufactured tobacco; and below, in the case

TRADE OF THE PORT.

Article.	Unit	Imports		Exports	
		Quantity.	Value Rs.	Quantity.	Value Rs.
Coal ...	Tons	2,374	33,236	0	0
Coffee ...	Cwts.	5,397	1,36,929	7,907	2,49,577
Grain, Pulse and Flour ...	"	49,717	2,83,393	37,444	1,85,030
Gums and Resins ...	"	1,201	20,502	2,472	59,811
Hardware ...	"	0	37,437	0	29,712
Hides, raw ...	No.	6,482	7,722	8,671	14,462
Oil, Fuel ...	Tons	71,801	16,89,009	0	0
" Kerosene ...	Gls.	31,784	20,225	1,464	1,041
" Petrol ...	"	21,928	23,872	976	1,084
Salt ...	Tons	0	0	27,675	2,77,650
Seeds ...	Cwts.	2,669	25,106	276	3,409
Skins, raw ...	No.	380,585	2,06,791	309,860	3,20,436
Sugar ...	Cwts.	26,607	1,31,390	20,827	1,00,059
Textiles—					
Piece Goods, Grey ...	Yds.	2,550,400	3,15,658	2,076,710	2,58,762
" " White ...	"	1,058,155	1,59,390	493,197	77,887
" " Printed or Dyed ...	"	1,348,524	2,64,435	1,567,708	3,57,095
Twist and Yarn ...	Lbs.	78,710	39,815	60,228	25,643
Tobacco, Unmanufactured ...	"	1,909,656	3,47,290	652,512	1,13,787
" Manufactured ...	"	77,765	96,973	78,204	73,627
Other Articles ...	No. of Pkgs.	109,815	13,68,105	21,279	5,51,788
Treasure, Private ...	—	0	3,79,755	0	2,05,220
Total ...	—	—	55,86,973	—	29,06,080

The number of merchant vessels over 200 tons that used the Port in June, 1936, was 146, as compared with 143 in the corresponding month last year, but the total tonnage was 581,000, as compared with 599,000.

Excluding coal, salt, fuel oil and Military and Naval Stores and transshipment cargo, the total tonnage of imports in the month was 10,300 and of exports 6,200, as compared with 10,500 and 7,100 respectively for the corresponding month last year.

of coffee, grain, pulse and flour, gums and resins, hardware, seeds, sugar, printed or dyed piece-goods, twist and yarn, manufactured tobacco, and private treasure.

Exports were above those for June, 1935, in the case of coffee, raw hides, white and printed or dyed piece-goods, and manufactured tobacco; and below, in the case of grain, pulse and flour, gums and resins, hardware, seeds, raw skins, sugar, grey piece-goods, twist and yarn, unmanufactured tobacco, and private treasure.

Port of London Notes

London Shipping.

During the week ended 24th July, 1,059 vessels, representing 1,131,186 net register tons, used the Port of London. Of these 615 vessels (921,018 net register tons) were to and from Empire and foreign ports and 444 vessels (210,168 net register tons) were engaged in coastwise traffic.

* * * *

During the week ended 7th August, 1,081 vessels, representing 1,071,963 net register tons, used the Port of London. Of these 530 vessels (872,041 net register tons) were to and from Empire and foreign ports and 551 vessels (199,922 net register tons) were engaged in coastwise traffic.

* * * *

During the week ended 14th August, 1,527 vessels, representing 1,089,420 net register tons, used the Port of London. Of these, 562 vessels (762,495 net register tons) were to and from Empire and foreign ports, and 965 vessels (326,925 net register tons) were engaged in coastwise traffic.

* * * *

During the week ended 21st August, 1,333 vessels, representing 1,123,529 net register tons, used the Port of London. Of these, 564 vessels (920,144 net register tons) were to and from Empire and foreign ports, and 769 vessels (203,385 net register tons) were engaged in coastwise traffic.

Tilbury Passenger Landing Stage.

Ninety-six vessels, totalling 803,053 gross register tons, used the Tilbury Passenger Landing Stage during the month of July.

The Port of Copenhagen.

The number of ships which entered the Port of Copenhagen during July, 1936, was:—From inland ports, 2,052 steam and motor-ships of 252,487 n.r.t. and 30 sailing vessels of 6,043 n.r.t. arrived. Shipping arriving from foreign ports amounted to 1,088 steam and motor-ships of 755,569 n.r.t. and 19 sailing vessels of 5,515 n.r.t. The total of steam and motor-ships and sailing vessels arriving from both inland and foreign ports for July, 1936, amounted to 3,189 vessels of 1,019,614 n.r.t.

Port of Ghent.

During the month of July, 1936, 178 ships of 190,650 n.r.t. entered the Port of Ghent, as compared with 133 ships of 150,078 n.r.t. in the corresponding month of 1935. This is an increase of 45 vessels and 40,572 n.r.t.

For the first seven months of 1936, 1,203 vessels of 1,239,507 n.r.t. entered the port, as compared with 1,006 vessels of 1,068,087 n.r.t. in the corresponding period of 1935. This is an increase of 197 vessels and 171,420 n.r.t. this year.

Empire Exhibition at Johannesburg.

A great undertaking in the realm of International Exhibitions is to be staged in South Africa during the period September 15th, 1936, to January 15th, 1937, when the Empire Exhibition will be held in the extensive and attractively-laid-out grounds of Milner Park, Johannesburg. Many countries will be prominently represented at the exposition, and all the important phases of life and activity of South Africa will be featured.

Four special tours from England have been arranged for the purpose of visiting the exhibition, and full particulars can be obtained from the Director, South African Government Travel Bureau, South Africa House, Trafalgar Square, London, W.C.2.

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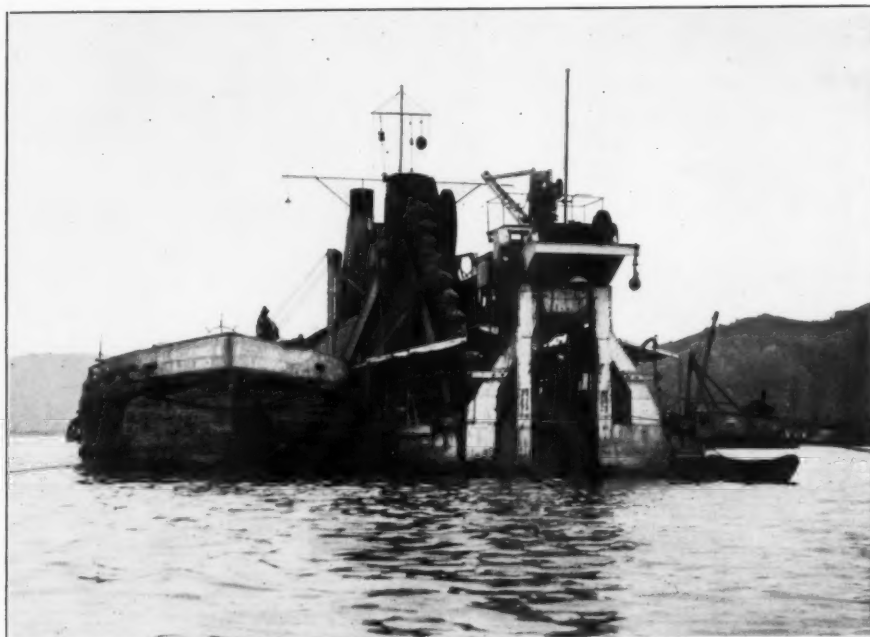
Full Particulars of all services and facilities can be obtained on application to the General Manager (Shipping and Harbour Department), South African Railways and Harbours Administration, Johannesburg.

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HAGAN EL FAVOR MENCIONAR EL "DOCK AND HARBOUR AUTHORITY" CUANDO ESCRIBEN A LOS ANUNCIANTES.

Irish Harbour Matters

New Dublin—Liverpool Boats.

MR. DAVID BARRY, general manager, British and Irish Steampacket Co., Ltd., has informed the Dublin Port and Docks Board that his company has placed an order with Messrs. Harland & Wolff, Belfast, for two new steamers for the Dublin-Liverpool service, to be ready by September of next year. The vessels will be 345 feet in length and 50 feet beam, and will have accommodation for 475 first class passengers and 119 third class berths.

New Traders' Member Co-opted.

To fill the vacancy caused by the death of Mr. Hugh Kennedy, Mr. Douglas Figgis, Dame Street, Dublin, an extensive grain importer, has been co-opted a trader's member of the Dublin Port and Docks Board. His co-option was effected by the casting vote of the Chairman, Mr. C. M. O'Kelly. His opponent was Mr. John J. Higgins, Lower Pembroke Street, a member of the licensed trade.

Concession in Dublin Port Dues.

At a meeting of the Dublin Port and Docks Board it was resolved, on the motion of the Lord Mayor (Alderman A. Byrne), seconded by Mr. T. F. Lawlor, to reduce dues by 20 per cent. on any vessel plying between Dublin and any port in the Free State, Great Britain and the Isle of Man, as from 1st January, 1937.

It is also provided that the ship be a passenger vessel capable of carrying cargo, and that her tonnage capacity does not exceed 22½ per cent. of her gross registered tonnage, and that she must not carry cattle, but may carry horses on deck in horse-boxes.

The engineer and his staff, and all concerned, were congratulated by the Board on the way in which they carried out the work at the new liner hall at Alexandra Quay. Mr. McGrath said it was an excellent building, and could be compared with the accommodation provided at any of the ports of Great Britain or the Continent.

Cork Harbour Board.

At a meeting of Cork Harbour Commissioners early in August, Mr. R. Wallace and Mr. D. F. Doyle paid tribute to the expeditious handling of four large liners in the port during Bank Holiday week-end, from which 1,500 passengers, with their luggage and motor cars were landed.

Mr. J. C. Rohan, chairman, said that for 40 years he had known the same efficient work to be carried on at the port.

The returns for the quarter ended 30th June showed that 1,258 tons of bacon were exported, compared with 1,150 tons for the corresponding period in 1935; butter 4,104 tons, compared with 4,600 tons; eggs 2,603 tons, compared with 2,767 tons, and pigs 5,148, against 3,794 last year.

Report of Newry Port Board.

Reporting on the accounts of the Newry (Co. Down) Port and Harbour Trust, Mr. R. Clarke, Local Government Auditor, stated that the excess of revenue over payments for the year was £1,117, compared with £754 in the previous financial year.

The serious loss incurred on the working of the inland navigation section of the canal continued during the year to the extent of £980, as compared with the loss of £1,015 incurred during the previous year. The members of the Trust are continuing to give serious attention to the matter, "which is proving itself very difficult of a satisfactory solution."

During the year the capital account for the canal improvement scheme was closed finally, and showed that the total cost of the scheme was £48,768, borne in equal shares by the Ministry of Commerce and the Newry Urban Council.

The tonnage (inwards and outwards) during the year was 11,066 over and above that for the previous trading year. The balance in favour of the revenue account stood at £4,109, compared with a credit balance of £2,992 at the close of the previous financial year.

The report was considered highly satisfactory.

North-East Coast Notes

Tyne Trade Topics.

AT the July meeting of the Tyne Improvement Commission, Mr. R. S. Dalgliesh presenting the report of the Docks and Trade Committee, stated that at the end of the first quarter of the year fuel exports were only slightly down, but by the end of June the fall was considerable. Stoppage of trade with Italy was the principal cause of the decrease in shipments, the quantity of coal sent to that country being down by 637,000 tons, as only 54,000 tons were shipped in the last six months. Now that sanctions had been removed and the financial position improved, he hoped that Italian trade would revive. The total quantity of coal and coke shipped from the Tyne in the first six months of this year was 6,415,641 tons compared with 6,643,997 tons in the corresponding period of 1935, a decrease of 198,356 tons.

A report prepared for the Docks and Trade Committee showed that the number of vessels using the port during the first half of the three last half-years indicated a declining volume of trade. In the six months ended June 30th, 1934, the totals were, 3,041 British vessels, and 1,534 foreign vessels, of a total of 4,253,970 tons; for the like period of 1935 the figures were 2,882 British vessels, and 1,505 foreign, with a tonnage of 4,031,700 tons; while for the first half of this year the figures were, 2,876 British vessels and 1,619 foreign vessels, of a total tonnage of 4,019,470 tons.

New Assistant Harbour Master.

Captain R. T. Sisterson, of South Shields, was appointed assistant harbour master at a salary of £300 per annum. Captain Sisterson, who was dock master's assistant at the Albert Edward Dock, holds an extra master's certificate. There were 215 applications for the post.

The cranes on the South-east quay at the L.N.E.R.'s Tyne Dock have been having a busy time recently. On one occasion in July there was discharged from No. 2 hold of the steamer "Harraton" 670 tons of Obregon ore by grab from 8 a.m. to 5 p.m. and 500 tons from 6 p.m. to 5 a.m., a total of 1,170 tons, while in one night No. 59 crane grabbed between 7 p.m. and 8 a.m. (less 1½ meal hours) 780 tons of Santander ore, which was a record rate of discharge.

Blyth Harbour Surveyed.

There was a departure from the usual course of procedure when Blyth Harbour Commission held the July meeting at Blyth, for the business gathering was followed by lunch given to a party of guests who later had a trip round the harbour to inspect the latest additions to the shipment facilities of the port.

At the business meeting it was reported by the Secretary (Mr. C. E. Baldwin) that the coal shipments for the six months of this year totalled 3,343,386 tons compared with 3,055,980 tons in the corresponding half of 1935, and 2,695,136 tons in the first half of 1929, thus showing an increase of 9 per cent. on 1935 and 24 per cent. on 1929.

Mr. R. M. Sutton presided at the lunch and the guests included the gentlemen of the Consular Corps representing Newcastle district, and other visitors, including Col. K. F. Angus, Chairman of the North-East Coast Coal Exporters' Association; Major F. J. Bywater, Chairman of the North of England Shipowners' Association; Mr. Bernard Hopper, Chairman of the Chartered Shipbrokers' Association; Mr. Paul Gibb, of the London & North Eastern Railway Company, and other gentlemen representing the trading interests of South-East Northumberland.

The Chairman, in welcoming the guests, outlined the history of the trade of the port and the work of the Commission, which was formed in 1882. There were now five shipping points, he said, which had 13 berths and these enabled the Commission to ship more than 6½ million tons in 1935. During the Commission's existence and up to the end of 1935 coal shipped totalled 174,556,631 tons. There was now a total deep-water area in the port of 140 acres with a depth of water in the channel of 25 feet at low tide. Extensions now going on in the upper part of the Harbour would give an additional 4½ acres of deep-water for the accommodation of shipping. He added as a point of interest that the largest cargo which had left the port was 11,493 tons.

The Greek Consul, Mr. S. A. Antonaropoulos, thanked the Commissioners on behalf of the Consular Corps, and Mr. R. S. Dalgliesh on behalf of other guests.

Tyne Commission's New Undertaking

Duchess of York opens New Staiths

A RED-LETTER DAY in the history of the Tyne Commission was Tuesday, July 28th, when the Duchess of York opened the new coal shipping plant at Hebburn, or, as it is called, Jarrow staiths. It has been constructed with a view to improving the facilities for the shipment of coal and coke. Constructed at a cost of £250,000 this electrically operated plant is capable with three shippers running, of loading 1,500 tons of coal per hour.

Bowes & Partners are to have the preferential right of use of the staiths, but coal and coke of any other collieries may be shipped by arrangement with the Company. Coal is brought from the collieries in waggons on to new standage sidings situated about a quarter of a mile from the river. Full standage accommodation is provided for 2,000 tons of coal in 20-ton waggons, while empty standage is provided for about 127 similar waggons. Full waggons gravitate along the



The New Coal Shipping Plant at Hebburn.

The Duchess of York, who was accompanied by the Duke, and a gathering of prominent personalities in the district (including Sir Arthur M. Sutherland, chairman of the Tyne Improvement Commission, and many other members of that body), actually set the machinery at the staiths in motion by turning a switch on the dais where the party gathered for the opening ceremony.

Afterwards the party returned to Newcastle where luncheon was served. The Duke of York, responding to the toast of "The Royal Family," said: "The industrial history of Tyneside is one of which you may be justly proud. I take the opportunity of congratulating the Commissioners on their firm optimism. We both sincerely hope that the forethought and enterprise that has brought this plant into being will do something to relieve the difficulties with which the people of this area have unfortunately been confronted. Though Tyneside is passing through dark days of depression, there are I think, real grounds for hope and confidence." His Royal Highness added that he was glad to know that it was the Government's intention that Tyneside should receive its fair share of Government work in the immediate future, and thus help in carrying out the large and important national programme for re-equipping the defences of our country. "Indeed, I am sure there are indications that you will be as famous in the future as you have been in the past."

"Tyne Improvement Commission and its Engineers and Contractors" was the toast submitted by Lord Glamis, chairman of Messrs. John Bowes & Partners. The Tyne Commission, he said, performed a vital service to the industry of Tyneside, not only by maintaining the Tyne as one of the finest ports of the world, but by co-operating with and supporting the many industries within its sphere of activities. Eighty-two years ago the pioneer steam collier John Bowes had revolutionised the carrying of sea-borne coal, and to-day John Bowes & Partners had undertaken for fifty years to ship every year through the most modern and efficient plant Her Royal Highness had opened that day, no fewer than one million tons of coal and coke. But this great contract by no means exhausted the capacity of the wonderful plant which was capable of dealing with double the amount he had mentioned, and it was to be hoped that other collieries would avail themselves of the facilities.

Sir Frank Simpson, replying, said whatever the future might hold for the staple industry of the country it could at least be said that the Tyne had not done less than fulfil its duty towards the reconditioning and re-establishment of the coal trade. There was every indication in this country at the present time of general trade betterment with an element of permanency in it.

The New Staith.

The new staith has two berths, one having a single loader and the other two loaders, suitable for large vessels, and is immediately west of the old Jarrow staiths. Messrs. John

standage sidings to the discharging hoppers and after being discharged by means of bottom doors, the empty waggons are raised by automatic electric lifts to the deck of an elevated structure and gravitate into the empty sidings. From the hoppers the coal is fed by means of jiggling feeders on to three 42-inch belt conveyors about 980 feet long running northwards to the river. The belts are made up of six uniform plies of 32 oz. duck, with a strength of 400 lbs. per inch width of warp and 210 lbs. per inch width of weft. The top cover and bottom is of rubber 1/4-inch thick and the belts are therefore reversible. The tensile strength of the rubber is 4000 lbs. per square inch on the original cross sectional area, with an elongation of at least 650 per cent.

Each shipping tower, together with its associated conveyors, is capable of handling 500 tons of coal per hour at a belt speed of 350 feet per minute. The shipping towers are each of latticed steel work carried on two four-wheeled bogies 50 feet apart to provide the radial movement of about 90 feet at the end of the loading arm. From each tower projects a sliding loading boom slung by wire ropes at the outer end, the inner end running on the bottom channels of the bridge connecting the tower to the pivot and by means of wire ropes from the top of the tower this boom may be raised or lowered to suit all sizes of vessels at all states of the tide. The boom has a telescopic movement of 58 feet. Coal is delivered into an anti-breaker at each loader or, when this is not in use, into the vessel alongside through a circular spout on the end of the boom conveyor. Coal can be loaded at a maximum height of 65 feet above high water ordinary spring tides and at a maximum distance of 60 feet beyond the edge of the quay, or into small craft close alongside. Power-driven Handcock anti-breakers 33 feet between tumblers are provided at each shipping tower and all possible precautions are taken to prevent breakage of coal. The whole of the plant is electrically driven by 3-phase, 50 cycle A.C. at 440 volts supply, which is taken from a sub-station on the site.

The staith has a river frontage of 1,300 feet, so that two large vessels can be placed alongside and loaded simultaneously. The depth of dredging alongside the staith is 25 feet at L.W.O.S.T. or 40 feet at H.W.O.S.T., with provision for a further increase of 5 feet in depth if and when required. A tier of moorings 500 feet long is provided at the east end of the staith for waiting vessels.

The scheme was designed by and has been carried out under the supervision of Mr. R. F. Hindmarsh, M.Inst.C.E., Engineer-in-Chief to the Tyne Improvement Commission, in consultation with Major E. H. Kirkup, M.Inst.M.E., of John Bowes & Partners, Ltd., while the details of the reinforced concrete work were prepared by L. G. Mouchel & Partners, the contractors being as follow:—Civil engineering work, Messrs. Holloway Bros. (London) Ltd.; Conveying and shipping plant, Messrs. F. Turnbull & Co., Heaton Junction, New-

Tyne Commission's New Undertaking—continued

castle; Sub-station electrical equipment, Messrs. A. Reyrolle & Co., Ltd., Hebburn. Sub-contractors:—Railway sidings, Thos. Summerson & Sons, Ltd., Darlington; Flood lighting for sidings, British Thomson-Houston Co., Ltd., Newcastle; Road and jetty and plant lighting, Watson-Norie Ltd., Newcastle; Suction and filtering plant, Sirocco Fan Co. (Messrs. Davidson & Co.), Newcastle; Anti-breaker cranes, Cowans, Sheldon & Co., Ltd., Carlisle; Electric motors, English Electric Co., Ltd., Newcastle; Electric wiring, Watson-Norie Ltd., Newcastle;

Switchgear, Igranic Electric Co., Ltd., Newcastle; Band conveyors, British Tyre & Rubber Co., and India Rubber Gutta Percha & Telegraph Works, Ltd.; Worm reduction gearing, Wallwork Gears; Electric cables, Johnson & Phillips, Ltd., Callenders Cable & Construction Co., Ltd., British Insulated Cables, Ltd.; Bituminous painting and enamelling, Wailes Dove Bitumastic Ltd., Bitulac Ltd.; Offices, Stephen Easton Ltd., and Benjamin Peel Ltd.; Demolition of buildings on site, J. J. King & Co., Ltd.

Notes from the North

Telephones at the Docks.

APPROACHES are being made to the Mersey Docks and Harbour Board with a view to getting them to provide telephone facilities at the docks wherever they are likely to be needed. It appears that some little time ago inconvenience was experienced by importers owing to the fact that occasionally cargo steamers were not berthed in docks belonging to liner companies, connected by telephone. The matter was brought before the Transport Committee of the Liverpool Chamber of Commerce, it being urged it would be of great assistance to the smooth working of the discharge of cargoes and save a considerable loss of time if telephone communications could be provided. The Postmaster Surveyor was asked for his observations.

The Postmaster stated that telephone communication with steamers in dock could be established by means of flexible cable, plug and sockets at the usual standard tariff rates for a telephone exchange line or extension line, plus an additional quarterly rental. It was also stated by the Postmaster that the River Tyne Improvement Commission rented seven exchange lines which were used exclusively for ship to shore communication on Tyneside. They provided a water-tight wooden box, at their own cost, of sufficient size to accommodate a telephone and a socket, to allow the telephone to be carried on to the ship and connected by means of the plug-ended cable and recovered as required. When the ship sailed the subscriber removed the box with the telephone and stored it in a locker which was kept on the quayside. The River Tyne Commission was responsible for the rental and call charges and they made their own arrangements for the collection of charges with the various shipowners using the facilities.

From other information obtained similar telephone facilities were available at a rental at Hull.

It will be interesting to know how the Mersey Docks and Harbour Board re-acts to the suggestion.

Sea Defences.

The Ministry of Health have appointed Mr. G. M. McNaughton, A.M.Inst.C.E., to hold an enquiry in connection with the Llanfaifechan Council's application for consent to borrow £7,650 for sea defence works.

New Grab Cranes.

The Ribble Committee of the Preston Corporation has been given sanction to purchase three grab cranes for the handling of road stone and other similar materials, at an estimated cost of £7,000.

New Dock Gate.

There was recently completed in the Mersey Docks and Harbour Board workshop at Coburg Dock, Liverpool, a big dock gate weighing more than 162 tons.

In accordance with Dock Board practice, the new gate is of greenheart—30 tons of it, together with some 32 tons of iron and steel work—and the whole of the work has been done by the Board's own staff.

The floating crane "Mammoth" hauled the gate from the workshop to the site of erection at the Brunswick Dock's 80 ft. river entrance. It was interesting to see the engineers get the new structure from its horizontal position in the workshop and "sailing aloft" at the end of the floating crane. With men hanging on to the guide ropes and the man at the crane issuing orders every minute or so, the dock gate rose slowly and surely, inch by inch.

I.O.M. Harbour Works.

The Isle of Man Harbour Board reports that an examination of the Alfred Pier, Port St. Mary, has revealed disintegration of the cement above and below low water level. If the stability of this structure is to be maintained, considerable repairs will be necessary during the next few years. Underwater repairs will be commenced in November next, when the most deteriorated portions of the foundations will be dealt with.

The store at the root of the pier has been condemned for further use, and is to be re-built next winter.

Isolated repairs have been carried out on the groyne at Peel, but the time has arrived when definite measures should be taken to retain the great accumulation of sand which at present exists, if the effectiveness of the groyne is to be maintained. During the coming winter work will be done on the timber bridge; and there will be a completion of the work done last winter on the old pierhead.

A further small reconstruction has taken place at Purt Veg, Port Erin, by the blanketing of the old wall in mass concrete, the construction of a slipway for small boats, and the raising of the adjoining ground to conform with the road levels. New doors and frames have been fitted to the store; surface drainage has been extended in the vicinity of the Fish Hatchery, and the cleaning and painting has been completed.

Radio Telephony.

Mersey Docks and Harbour Board has decided to establish a radio-telephony service between the Pilotage office at the Canning Pierhead and the pilot boats at sea, and to make an arrangement accordingly between the Board and the Postmaster General. The service at the outset will be for an experimental period of six months and at the end of that time, if deemed satisfactory, the scheme will be placed upon a permanent basis.

Piling Machine Undermined.

Sir John Wolfe Barry & Partners, consulting engineers, have reported to the Rhyl Council that a steamer loaded with timber stranded upon the north side of the river close to the piling machines working in front of the West Promenade. The tide sluiced the vessel across the river thus forming a dam with the result that the piling machine was undermined and had to be removed to avoid further damage. The contractors were put to considerable expense in removing and re-setting the machine and three days' work was lost. The steamer grounded again by Horton's Nose and interfered with the working of the steam navy. The number of men employed upon the works is at present 66.


Mr. Marshall Stevens.

Mr. Marshall Stevens, the first general manager of Manchester Ship Canal, died at Plymouth (his native town) in his 85th year. He was one of the promoters of the Manchester Ship Canal and he attended the historical meeting in Daniel Adamson's house in 1882 at which it was decided to convert Manchester into a sea port.

His special knowledge of commercial, railway and shipping matters were of great value in securing powers for constructing the Ship Canal. The evidence he gave in Parliament on all aspects of the proposed canal occupied ten days and provided answers to 2,749 questions.

In 1885 Mr. Stevens gave up his shipping business and became the provisional manager of the canal and, when the company was formed, the first general manager. It was his duty to organise the campaign which resulted in the authorised capital for this huge undertaking being subscribed by 40,000 shareholders. Later he carried out negotiations with Manchester Corporation, which found the remaining capital that allowed the canal to be completed after unforeseen engineering difficulties had used up the money subscribed.

When the canal had been open for three years Mr. Stevens thought that additional traffic could be obtained for the canal by developing Trafford Park as an industrial estate and he became managing director of the Trafford Park Estates, Co., which had just been formed to deal with the 1,200 acres of land acquired from Sir Humphrey de Trafford. Mr. Stevens covered it with railways, roads and factories, with the result that its 150 works and depots now support a population of more than a quarter-of-a-million people. He also established the Port of Manchester Warehouses, Ltd., one of the largest warehousing concerns in the world.



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Port of San Francisco, California



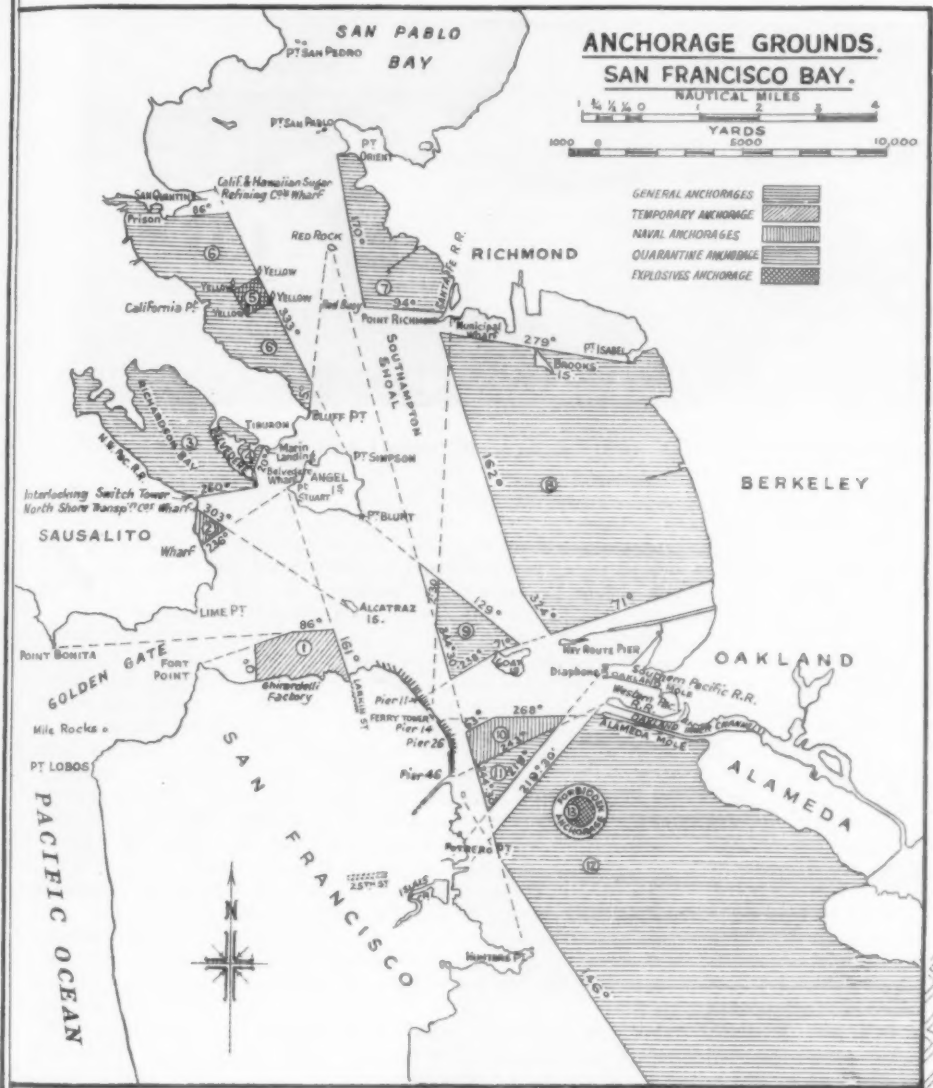
Aerial View of San Francisco taken in 1930, showing Harbour's Piers and Ferry Building.



Scene at the Union Plant of the Bethlehem Shipbuilding Corporation, Ltd., with Coastwise Liner "H. F. Alexander" in repair slip.

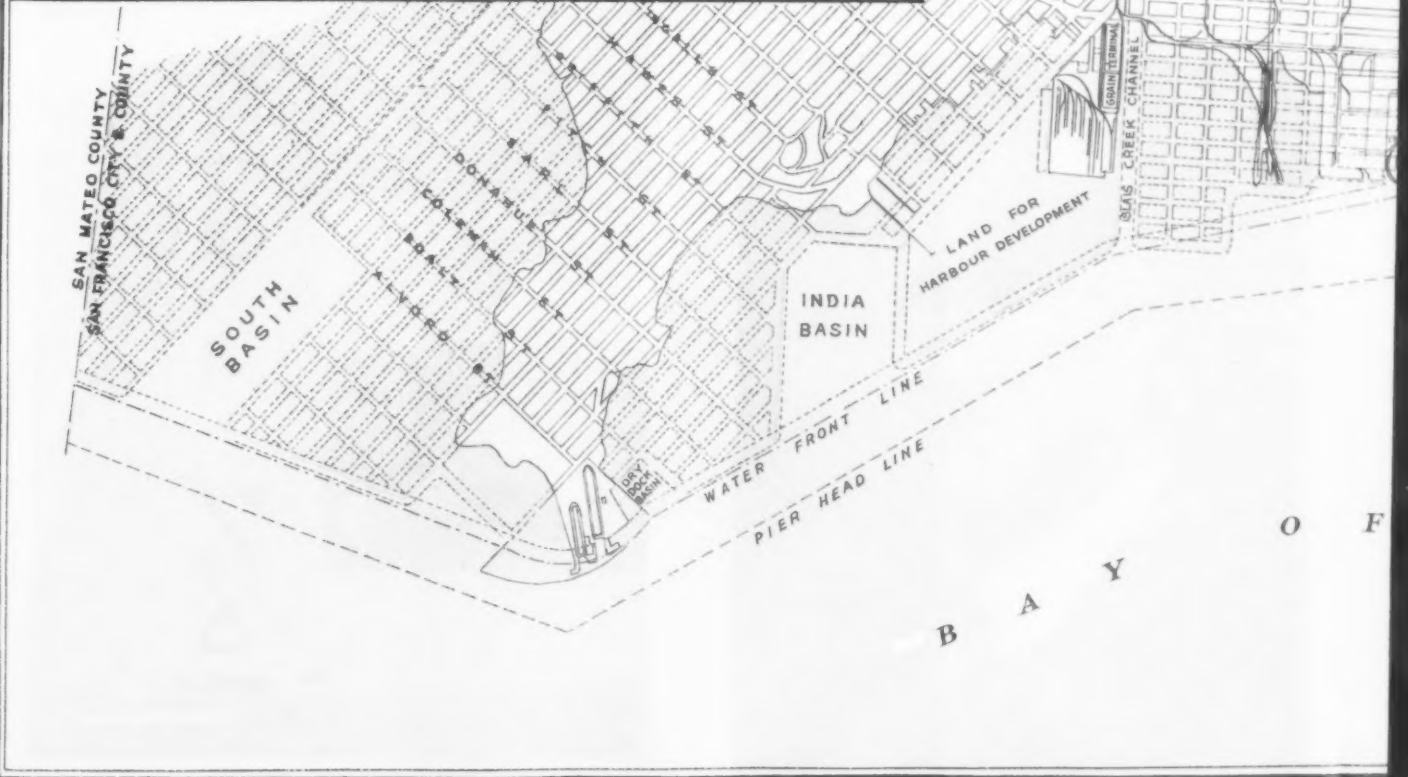
PORT OF SAN FRANCISCO

UNDER THE JURISDICTION OF THE BOARD OF STATE HARBOUR COMMISSIONERS



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FROM

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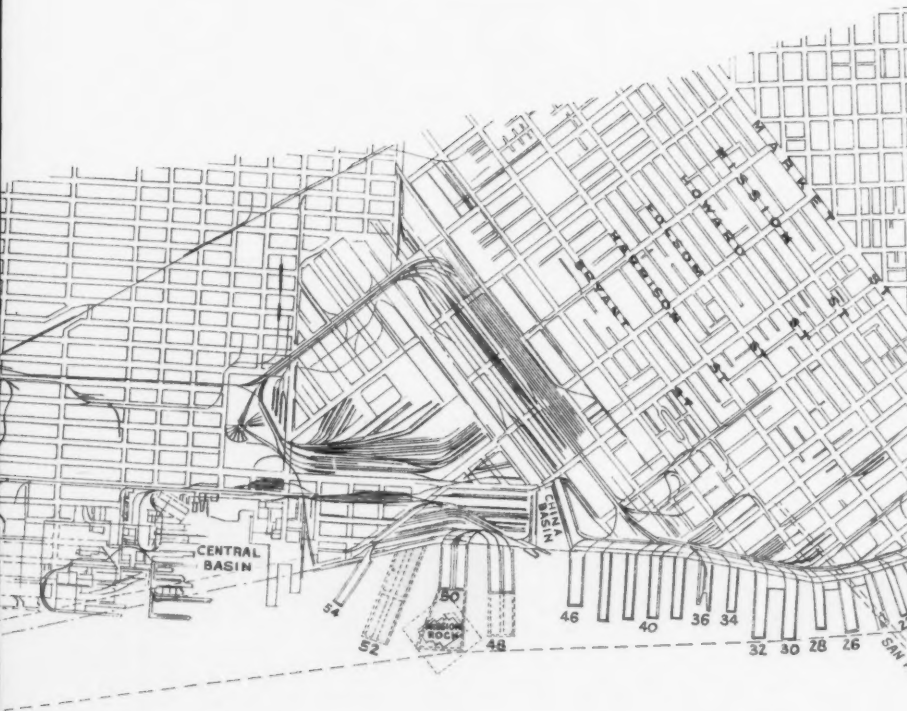
ONERS.

THE WATER FRONT OF SAN FRANCISCO FROM THE COUNTY LINE TO THE PRESID

Scale of Feet.

FEET 1000 500 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10,000 FEET

*NOTE;- Reclamations, Piers etc. in hand or proposed
are shown coloured RED.*



F S A N F R A N

CO
SIDIO.

10,000 FEET



SAN FRANCISCO
CALIFORNIA

The Port of San Francisco, California

By P. W. MEHERIN, President, Board of State Harbour Commissioners



Ample Berthing and Cargo Space at this Pier—23. Constructed in 1930 at a cost of 600,000 dollars.

History.

NATURE, and nature at her best, gave to San Francisco one of the three greatest landlocked harbours of the world. Yet it remained undiscovered until the eighteenth century was well on the wane.

For two long centuries, prior to its discovery, Cabrillo, Drake, Cermenon, Vancouver and other stout adventurers of Spain and England, sailed up and down the coast of Western America in quest of some such anchorage, and failed to find it.

It was not until Portola's missioners viewed its calm waters from the land side, and Lieutenant Ayala was sent up from Monterey to locate the entrance to the newly discovered harbour of San Francisco, that a ship found its way thither, and the Spanish government schooner San Carlos sailed through the heads one August day in 1775.

The little two-masted packet was the first craft to enter the portals of the far-famed Golden Gate, and cast anchor in what was to become known as San Francisco Bay. The native Indians that lived in the bay country were timorous of the sea, and never mastered its mysteries, according to Edward Morphy, recognized authority on early days of San Francisco harbour.

For a quarter of a century after Lieutenant Juan de Ayala viewed the wooded hills about the bay from San Carlos' deck,

but few vessels found their way in through the Golden Gate. Then one day in April, 1806, the Russian trading schooner Juno, down from the northern settlements of Alaska for supplies of meat and grain, dropped anchor off the shores of Yerba Buena, and San Francisco's first waterborne commerce was under way. It was at this anchorage that the English sloop Raccoon lay when she entered the port in 1816, to hear the news of Waterloo. There also rode the French frigate Artemisia, the first to bring the tricolor into the port, in 1827, and there also lay the sloop San Luis in 1841—the first American warship to fly the Stars and Stripes in San Francisco Bay.

And the Portsmouth belched her salute of twenty-one guns from her anchorage at Battery Street when Captain Montgomery hoisted the American flag on the Mexican flagstaff outside the Custom House on the plaza, and San Francisco was transformed from a Mexican Pueblo into the nucleus of an American city.

Captain Frederick William Beechey, who came here in the British sloop Blossom, in 1826-27, proceeded to make a survey of the harbour and its vicinity. Captain Beechey's chart of San Francisco Bay, and a map of the adjacent country, was subsequently published by the British government and is undoubtedly the best record now existing of the topography of San Francisco and its environment of a hundred years ago.

Tall ships from all ports in the civilised world followed to exchange their wares for hides, minerals and other products



Main Tower of Golden Gate Bridge, 740-ft. above the water. The bridge is now about 75 per cent. completed. Inset—North Beach District and Golden Gate Bridge as seen from Telegraph Hill.



P. W. MEHERIN.

President, Board of State Harbour Commissioners, San Francisco.

Port of San Francisco—continued

of California. The discovery of gold in 1848 was the signal for one of the greatest maritime races in history. Ships of all descriptions turned their prows to the Golden Gate, and scores of them left their barnacle-encrusted hulls to sink in the mud-flats of the bay while their crews dashed off to the brown hills in quest of gold.

But all the gold of '49 never was and never will be worth as much to the city of St. Francis as her Golden Gateway to the sea and the safe harbour that is her front yard.

The first suggestion of possible development of the port occurred under the Mexican regime in 1835, but this harbour had no existence, so far as its present outline is concerned, until about 1863, when the first Board of State Harbour Commissioners came into existence. San Francisco Harbour lands and facilities of to-day are valued at approximately \$90,000,000, and include 42 modern piers and 17 miles of berthing space. Virtually all the harbour improvements constructed in the last two decades, at a cost exceeding \$25,000,000, have been carried out under the immediate direction of Frank G. White, Chief Engineer of the Board of State Harbour Commissioners.

If Portola's missionaries could stand to-day upon the peninsula hills overlooking San Francisco Bay, as they did one hundred and fifty years ago; if Captain Ayala could again sail in through the Golden Gate on the bridge of his gallant little packet San Carlos; if Cabrillo, Drake, Vancouver and the other keen-eyed discoverers could come back—if only they could come back—even for a passing view of San Francisco Harbour of to-day with its two great bridges—one spanning the Golden Gate, and another the bay proper; if they could view the sweeping configuration of docks along the waterfront, and a magnificent city shimmering in the golden sunlight—what would they say?

Doubtless, it would be—"GLORIA IN EXCELSIS!"

The Port of To-day.

To-day, San Francisco is linked by a myriad of steamship lines to every port around the globe. The vessels of every seafaring nation of the world are familiar sights along The Embarcadero. Not a day passes, but a score of heavily laden ships pass in through the Golden Gate to deposit goods of the world on San Francisco's docks. Not a day passes, but what an equal number turn their prows to the sea loaded to the plimsol mark with produce of western United States. During 1935, goods worth considerably in excess of half a billion dollars crossed the piers of the port.

San Francisco is the home port of twenty large American steamship companies. More than forty foreign lines maintain offices and agencies here. Altogether, 146 steamship lines operate regularly at this port. More than 500 ships call here every month of the year, and a majority of these ships purchase a major portion of their supplies from San Francisco merchants.

The story of foreign and domestic cargo handled over the piers of the Port of San Francisco is so extensively general and diversified in character as to be bewildering in detail. From peanuts to peatmoss, bulk oil shipments, steel, iron, machines and vehicles, wood and paper, metals and machinery, manufactured goods, vegetable food products, fresh fruits, animal products, drugs and chemicals, textiles and so on, it ranges up and down through a vast array of classified com-



Section of Fishermen's Lagoon Area—haven for 400 fishing craft. Sardine Fleet of Purse seiners in middle background.

modities imported and exported, inbound and outbound, foreign and intercoastal, making up a balanced trade of staggering values collectively.

Within the decade from 1920 to 1930, general cargo movements in and out of the Port of San Francisco virtually doubled. During the biennium commencing July 1, 1928, and ending July 1, 1930, cargo passing over the port's piers totalled 21,688,213 tons of a value of \$1,135,000,000.

Then came the period of national business recession which enveloped all American ports from the summer of 1930 to mid-summer 1933, when a slight, but welcome breeze began to shake off the doldrums.

Present shipping levels, while still somewhat below what traffic experts of the port declare they should be, show definite and encouraging gains. Cargo handled over the piers of the port during 1935 reached close to the 10,000,000 ton mark.

With waterfront labour difficulties out of the way, harbour officials express belief that the upward tendency of business recovery of the port will go forward.

From the start, the great landlocked Bay of San Francisco, with its 450 square miles of deep water, 100 miles of shoreline, and its navigable rivers, the Sacramento and the San Joaquin, flowing into the bay from the rich producing interior of Northern California, basically lent to itself present high standing in world commerce.

It is only because of its unsurpassed maritime service San Francisco has enjoyed for so many years that California is able to compete in the markets of the world with her manufactured goods and her vast agricultural products. Fruits, cotton, hay and grain grown in the great inland valleys, all find their way to the wide-flung markets of the world by way of The Embarcadero. Close up the Golden Gate, and you would shut out half of the commercial life of Northern California.

During the 1935 fruit season, 320,000 packages of California fresh fruits were precooled at the State Refrigeration Plant in San Francisco, and exported. England was the best customer.

Future Development of the Port.

The Port of San Francisco has ample facilities for even greater increased shipping. Improvements are continually being made in keeping with requirements. Its potentialities are immense.

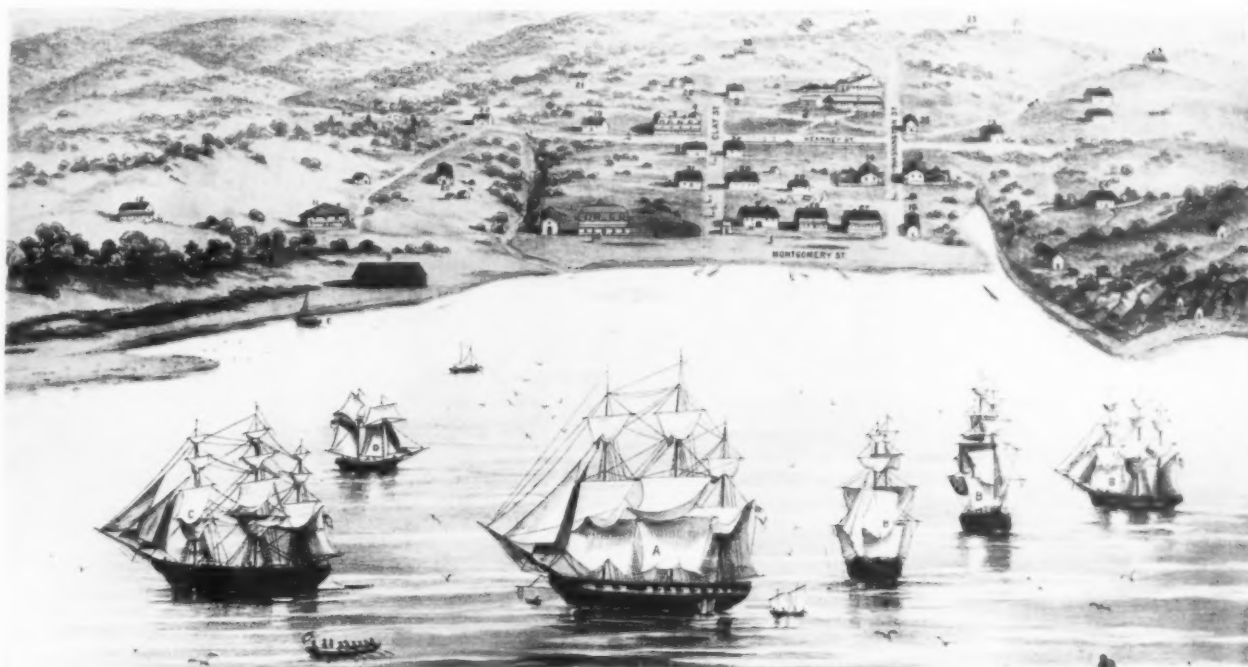
Consideration of plans for replacement of Piers 9 and 19, north of the Ferry Building, is now before the Board of State Harbour Commissioners. These piers are regarded as obsolete, and their replacement is part of a plan begun several years ago, during which Piers 1, 15 and 23 were rebuilt and extended as modern structures, affording greatly increased berthing and cargo space, and generally harmonising with other pier construction along The Embarcadero.

Work is now well advanced upon a connecting wharf and bulkhead building between Piers 24 and 26, and a bulkhead wharf, replacing an old wooden structure between Piers 44 and 46. The cost of these two projects will run to about \$400,000. The



Pier 45 with total covered area of 416,561 sq. ft. Proposed location for Foreign Trade Zone.

Port of San Francisco, California



San Francisco in 1846-7, before the gold rush, showing Waterfront and Settlement.



San Francisco of To-day—Queen of the Pacific. Harbour Ferries' Gateway and Business Section.



Typical Group of Modern Piers immediately North of Ferry Building with bay view of famous Alcatraz Island "The Rock."

Port of San Francisco—continued

latter improvement will put a finishing touch to the great seawall, started in 1867, and behind which the present water-front land of San Francisco was filled. Although this colossal seawall is invisible, it is decidedly real. It extends along the city's water-front for a distance of 13 miles when its contour is considered. This seawall was a constructed fill of huge boulders and rock dropped into a channel or trench 100 feet wide at hard bottom, and is 35 to 45 feet below mean tide level. It was built in sections.

During the last year, three finger piers were constructed in Fishermen's Wharf area to accommodate larger-size fishing craft, engaged in sardine fishing—an industry which has become of immense importance to the port—and to relieve congestion of smaller fishing boats.

One of the most important harbour improvements recently completed, was the extension of the State's Belt Railroad across the Third Street Bridge, giving the Belt Line complete connection from Fort Mason to China Basin, providing direct service to piers and industries along harbour land to the south, where future development of the port must of necessity go.

Establishment of a foreign trade zone in some feasible location along the San Francisco water-front is now being considered by the Harbour Commissioners. Through an enabling Act passed by the last legislature, and approved by Governor Merriam, the way has been made clear for preliminary compliance with the terms of a Federal law enacted in 1934, providing for the establishment and operation of foreign trade zones in ports of entry in the United States. Foreign trade zones as contemplated in the Federal act, are designed primarily in the interest of the free port trade.

Another harbour improvement of major consideration is the proposed extension of the shipside State Refrigeration Terminal to accommodate the fast-growing export trade in California fresh fruits, precooled at the plant before being loaded aboard ships. The plant has a capacity of 200,000 packages for pre-cooling at one time. The turn-over is rapid, as fruit received from the back country can be precooled and made ready for export loading in forty-eight hours.

Control and Management of the Port.

Owned and operated by the State of California, and under the immediate control and management of a board of three commissioners appointed and holding office at the pleasure of the Governor of the State, the Port of San Francisco is sort of a fixed star in the galaxy of seaports of the United States. It is unique among the greater ports of America and probably among those of the world. It is the only harbour that proffers such exceptional facilities and other great attractions to shipping men without imposing a dollar of taxation upon the community. It is a port, physically efficient, with the most modern and efficient equipment to cope with all possible maritime traffic of the hour, and has potentialities of expansion to meet all requirements of the future. Every wharf, every



Shipside Banana Terminal, also served by State Belt Railroad.

pier is owned and controlled by the State. The port is and always has been self-supporting, and is operated on a non-profit basis. Port charges are fixed at minimum cost of efficient operation, maintenance and improvements. Piers and warehouses that are continuously used by various established shipping concerns are held by such concerns on monthly tenancies, under agreements that may at any time be terminated.

Naturally, it is the policy of the State to foster in every respect every enterprise calculated to promote the interest of the port, and to meet, as far as possible, the requirements of companies running regular service. Therefore, all the companies that require such accommodation have their own regular piers, wharves and warehouses whither and whence their lines come and go.

Larger ships—the trend of the times—require larger berthing space and cargo accommodation. Hence, it is the policy of the Harbour Commissioners in authorizing new pier construction and replacements, to be guided by this expediency.

San Francisco's potentialities, as a unit, are immense. As a major "Port District of San Francisco Bay," such as has been from time to time suggested, and considered advantageous by national resource experts who advocate the "plural ports" plan, its possibilities of expansion would be practically without limit.

San Francisco has a harbour which, as was said of it more than a hundred years ago, in which all the fleets of the world could find anchorage. The same holds true to-day.

Shipping men the world over recognise the Port of San Francisco as one of the most important on the American continent. Its strategic position in the Pacific has fixed its prestige for ever in maritime affairs.

In determining ratings of American ports, national resources' authorities place San Francisco second only to New York in value of water-borne tonnage handled over its piers. New York is, of course, in a class by itself.

Californians in general, and San Franciscans in particular, always have, and always will, regard this natural harbour as a priceless heritage.

The poetic history of San Francisco Harbour, with its romance and beauty, has been written innumerable times, yet it seems never to lose its descriptive charm—and never will lose it!

Bridges.

Completion of the Golden Gate Bridge, the world's longest and tallest suspension span, is now a matter of months. As this is written it stands 70 per cent. completed. It is expected to be completed and ready for traffic in March or April, 1937. The cost of the bridge will be approximately \$35,000,000.

The length of span of the Golden Gate Bridge is 4,200 feet; length of approach spans, 1,225 feet; total length of bridge, 6,450 feet. The towers are 740 feet high; mean clearance at centre, 200 feet; width, 90 feet, with a capacity of transit of 283,000 automobiles every 24 hours.

Work on the San Francisco-Oakland Bay Bridge, also, is well advanced, and is expected to



Historic Ferry Building, known around the world as the doorway to a Majestic City. Vehicle subway under the Embarcadero in foreground.

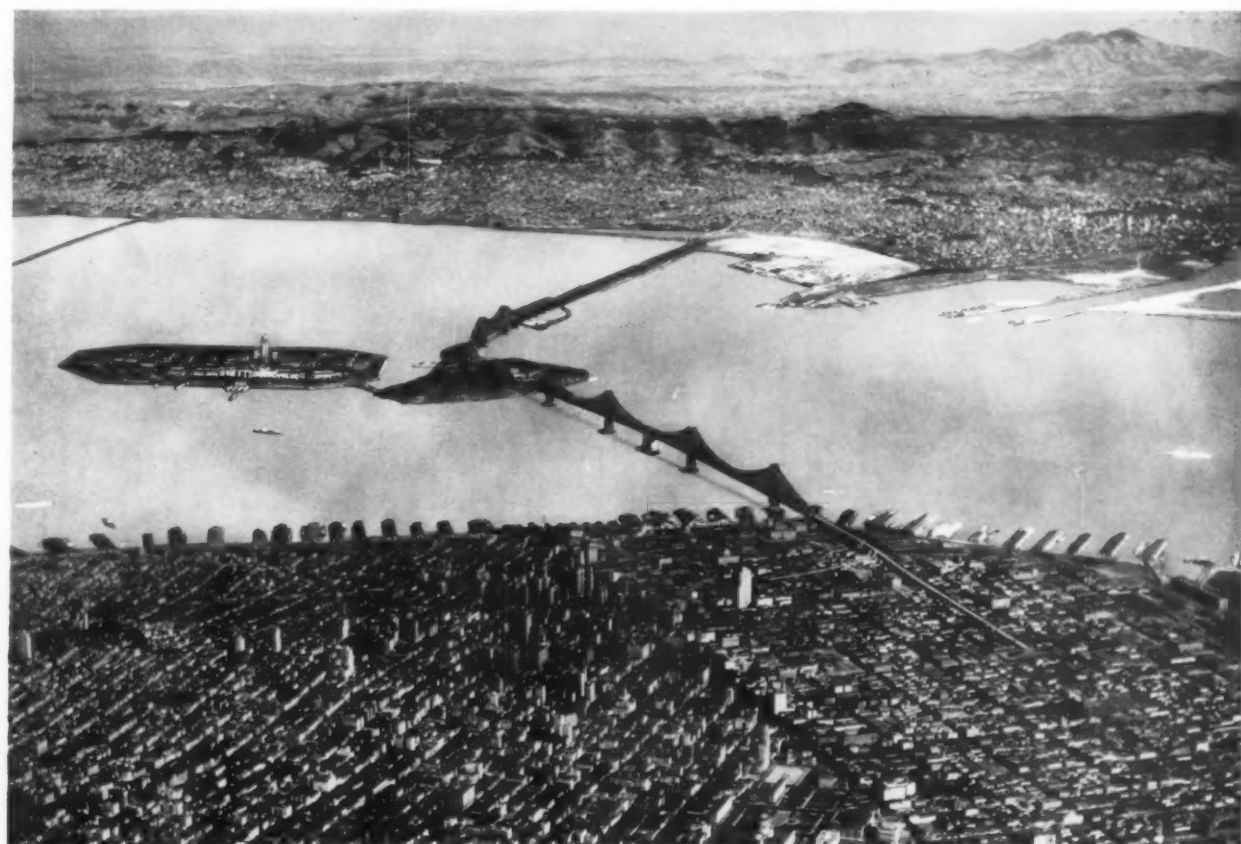
The Port of San Francisco, California



General view of Graving Docks of Bethlehem Shipbuilding Corporation, Ltd., Hunter's Point, San Francisco Harbour.



Pier 46 and, adjoining it in the background, the State Pre-Cooling and Products Terminal. Pier 46 is being made available for the extension of the Terminal so that five to six major ships may be docked there at one time to take on or discharge cargo.



HOW SAN FRANCISCO BAY WILL LOOK IN 1939

Upon an aerial photograph of San Francisco Bay, with Oakland in the background, architects for the San Francisco-Oakland Bay Bridge have drawn in to scale a representation of the World's Largest Bridge, $8\frac{1}{2}$ miles long (nearly 4 miles over water), which will connect Alameda and San Francisco Counties. To the North of Yerba Buena Island is shown a prospectus of the 1939 Bridge Exposition Island soon to be built.

Port of San Francisco—continued

The State Grain Terminal at Islais Creek. Rising from the centre of the structure are New Grain Bins, erected during 1932 at a cost of 35,670 dollars. The capacity of the new bins is 1,300 tons, including the mixing bins. At the left of the scene is the new Wharf J 92 under construction.

be open for automobile service late this year, and fully completed early in 1938. The bridge is $8\frac{1}{4}$ miles long (nearly 4 miles over water) and connects San Francisco and Alameda counties.

The lower deck of the Trans-Bay Bridge carries two tracks for inter-urban electric cars, and three lanes for heavy trucks, and the upper deck carries 58-foot highway for six lanes of automobiles.

A double-deck tunnel pierces Yerba Buena Island, occupied by the Army, Navy and Lighthouse services, and the double-deck bridge continues over 1,400-ft cantilever span, 5 through truss spans, and 14 deck truss spans before it lands on a fill extending out from the Oakland shore.

The bridge is being built for the California Toll Bridge Authority of which Governor Frank F. Merriam is chairman, by the State Department of Public Works, under Earl Lee Kelly, director. C. H. Purcell is chief engineer.

The total cost of this colossus will be approximately \$75,000,000.

Ferry Traffic.

Bay ferry traffic long antedates the hundred years of San Francisco commercial life. In 1822, Captain William A. Richardson, erstwhile mate of a British merchant ship, who had seen fit to tarry and marry in California, located at Sausalito. He operated a bay ferry service, which he later expanded by taking over two sail boats built for Missions Santa Clara and Dolores by the Russians at Fort Ross.

With these he engaged in the hide and tallow trade on the bay, charging \$1 a sack freight on tallow and 12½ cents a hide.

Capt. Richardson had it all his own way until 1839 when Nathan Spear started a rival ferry.

In 1840, John A. Sutter put a sailboat in service between his colony of New Helvetia at Sacramento and the new town of San Francisco, thus inaugurating river traffic.

The first steamboat to ply the bay was a vessel brought here from Alaska by Captain W. A. Leidesdorff. It was named the "Sitka." When ox-teams starting after the "Sitka" out-distanced it to Sacramento, it became a laughing stock and was retired from service.

The tremendous boom of the gold rush days stimulated a demand for transbay ferries which was speedily met by enterprising Argonauts. The service rapidly improved until by 1870 widewheel ferry boats, which have not yet entirely passed from the picture, were supplying hourly service between San Francisco and Oakland.

The ferries are virtually doomed by the two great bridges across the bay being sped to near completion. Passenger ferries to Oakland are believed to be destined for abandonment. Auto ferries have announced they intend to compete with the bridges to the best of their ability.

Harbour Commissioners.

The Port of San Francisco is owned and operated by the State of California, and is under the management of the Board of State Harbour Commissioners, members of which are appointed by the Governor and serve at his pleasure. The port is and always has been self-supporting, and is operated on a non-profit basis. Port charges are fixed at minimum necessary to meet the cost of efficient operation, maintenance and improvements.



Top—Piers 35 and 37. On the left is the Canadian Pacific Flagship "Empress of Britain," which paid the city her fifth annual visit on May 2nd, 1936.

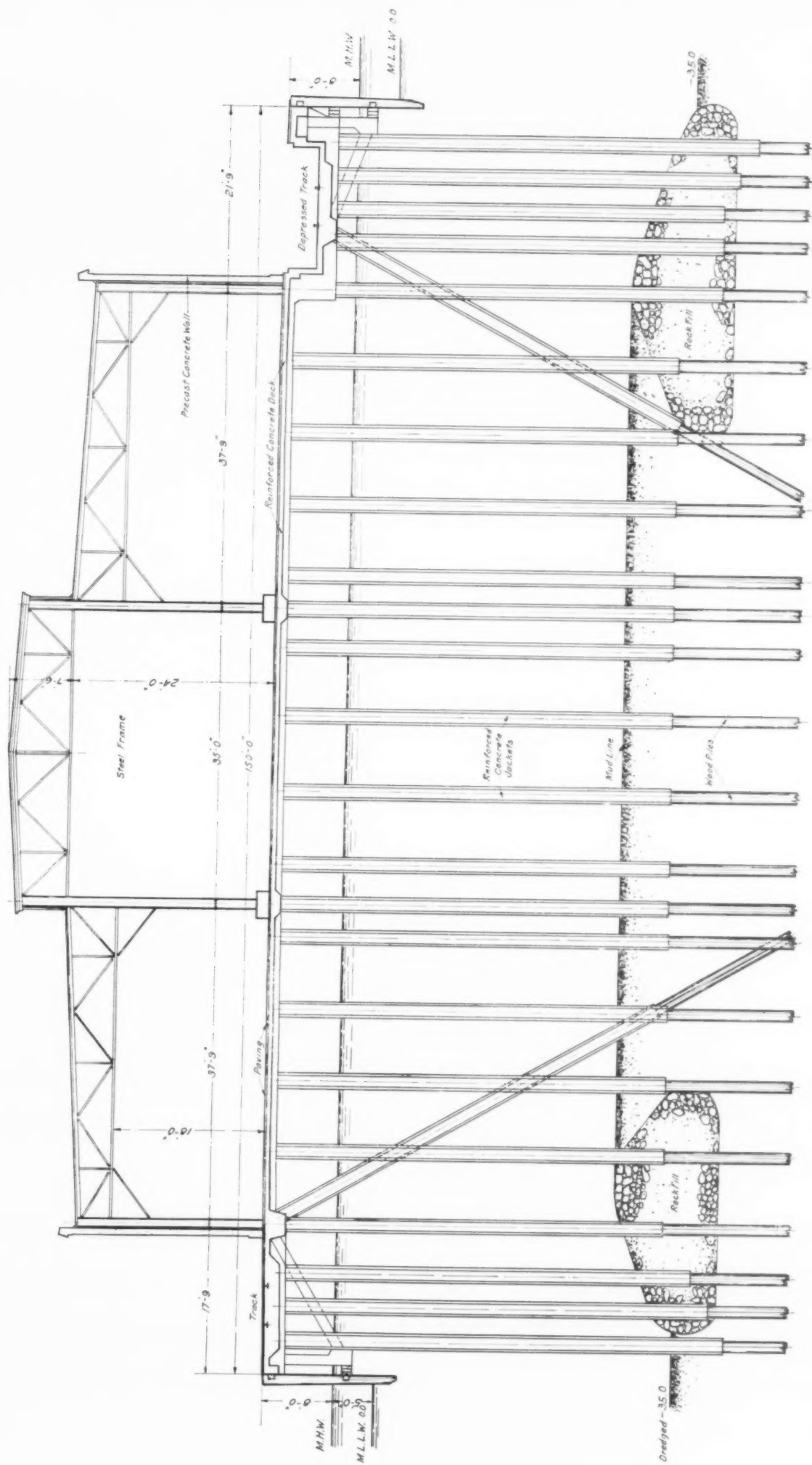
Bottom—U.S. Battleship Pennsylvania and intercoastal liner Virginia snubbed to the Embarcadero at Piers 37 and 39.



Top—Interior view of Pier 1 with grain cargo ready for movement.

Bottom—General cargo makes up the bulk of San Francisco's tonnage. This view shows more than 200 carloads of miscellaneous merchandise assembled on one pier for shipment.

The Port of San Francisco, California



Typical Cross Section of Pier 23.

Port of San Francisco—continued

Top—State Products Terminal, China Basin, showing second floor loading platform.
Bottom—China Basin Terminal when completed.

The Harbour Commissioners are: P. W. Meherin, President; Joseph A. Moore, Commissioner; Dr. Celestine J. Sullivan, Commissioner.

The principal officers of the Harbour Commission are: Mark H. Gates, Secretary; Joseph P. Cereghino, Assistant Secretary; Frank G. White, Chief Engineer; H. E. Squire, Assistant Engineer; John A. Sullivan, Chief Wharfinger; Joseph V. Nardini, Supt. Belt Railroad; John Bermingham, Jr., Supt. State Refrigeration Terminal; William Crowley, Traffic Manager.

Offices: Ferry Building, San Francisco, California.

Facilities of the Port.

San Francisco harbour facilities are worth, at a minimum \$85,000,000. They include: Piers, 42; Passenger and auto ferry slips, 14; Car ferry slips, 6; Terminals, 3; Berthing space, 17 miles; Cargo area, 186 acres; Cargo area capacity, 2,030,600 tons.



Top—Grace liner "Santa Rosa" coming alongside her berth at pier 35.
Bottom—Huge lift bridge spanning the Channel at Third Street.

Among the special facilities are grain terminal, a shipside refrigeration terminal, a banana terminal, a fruit and produce terminal, a pipeline and tank for handling oriental vegetable oil, a fumigation plant, and Fishermen's Wharf and Lagoon with space for 325 fishing boats.

Five miles of San Francisco's waterfront and 450 acres of waterfront land owned and controlled by the State are available for piers, wharves, channels and industries.

Miscellaneous Equipment.

Miscellaneous Equipment: 2 tugs, 5 piledrivers, 2 dredgers, 2 fireboats, 1 launch.

The fireboats, strictly modern, are maintained jointly by the Board of State Harbour Commissioners and the City and County of San Francisco. They are in constant service on the waterfront for the protection of shipping and of State and adjacent City property. State tugs also are equipped for fire fighting.



100-ton Lift from ship to rails of Belt Railroad by Haviside's powerful electric derrick barge.

Docks and Slipways.

In the Port of San Francisco are readily available not only some of the world's largest and finest drydocks, but also slipways and excellent facilities for handling cargo. They include:

Graving Docks.

There are two graving docks in the port, the dimensions of which are as follows:—

Length	Width, top	Width, bottom	Depth, over Sill
ft. 750	ft. 103	ft. 74	ft. 28
1,020	153	110	45
			in. 6

Floating Docks.

The port has five floating docks available, with the following dimensions:—

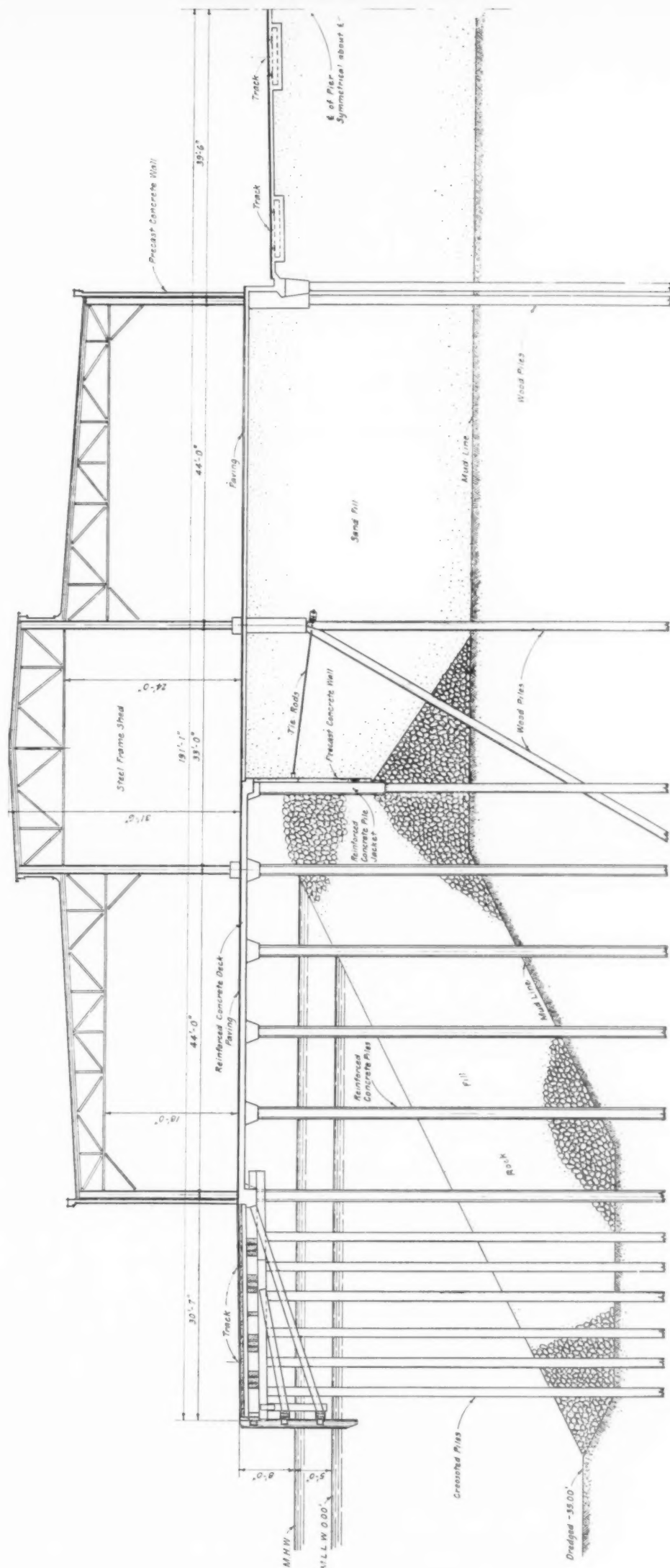
Length	Width	Capacity
ft. 271	ft. 66	tons 2,000
in. 0	in. 0	
301	68	2,500
450	80	6,500
460	92	15,000
238	92	10,000
6	0	

Slipways.

There are eight slipways, with dimensions as follows:—

Length	Width	Capacity
ft. 452	ft. 68	tons 8,000
422	68	7,000
422	68	6,000
340	65	4,000
250	60	2,500
434	76	6,000
82	32	800
146	52	1,000

The Port of San Francisco, California



One-half Typical Cross Section of Pier 45.

Port of San Francisco—continued

Sheer-Legs.

2 stationary, 100-ton capacity.
1 floating, 20-ton capacity.

Floating Boom Derricks.

There are nine floating boom derricks of the following dimensions:—

Length of boom ft.	Lifting capacity tons
90	7
100	7
100	30
100	40
107	100
100	25
100	30
100	50
100	100

Salvage Equipment.

1 sea-going salvage and derrick barge. Length of boom, 100-ft.; lifting capacity, 100 tons.

Current Statistical Data.

Cargo tonnage, 1935	...	9,588,046
Vessels entering Golden Gate, 1935	...	5,933
Net registered tonnage	...	17,415,334
Port Revenue, 1935	...	\$2,786,755
Number of steamship companies operating regularly at this port	...	146

Ferry Building.

One of San Francisco's best known landmarks, the Ferry Building, was opened to the public in July, 1898. Its strikingly beautiful tower was patterned after that of the Cathedral of Seville, in Spain.

Length	...	661 ft.
Width	...	150 ft.
Height of Tower	...	235 ft.
Cost, including appurtenances	...	\$3,105,000
Number of persons passing through the Ferry Building in 1935, over	...	50,000,000*

*This is a greater number, it is said, than passed through any other railway terminal in the world, with the exception of Charing Cross Station in London.

State Belt Railroad.

Extending along the waterfront from Fort Mason, Presidio, on the north to China Basin on the south, is the State Belt Railroad, the first unit of which was built in 1890.

It has direct connection with all transcontinental and local railroads, and spurs to 40 piers as well as to various industries along its route.

Total mileage of tracks operated is now sixty-six. Equipment includes seven modern locomotives and one locomotive crane, which gradually are to be replaced with Diesel electric locomotives. During the past five years the number of cars switched averaged 145,636 per year, or an average of 486 cars for each.

Cargo and Revenue.

Conditions which caused decreasing tonnage and revenues during the previous biennial period continued through most of the biennium from July 1, 1932, to June 30, 1934. There was a slight increase in tonnage, however, in the last year of this biennium, which indicates the extreme low period has been passed, and the business of the port is again on the upgrade.

Cargo handled through the facilities of the port during the previous biennium totalled 21,217,269 tons, and for the last biennium, 17,701,132 tons. This represents a decrease of 3,516,137 tons, or 16.6 per cent. under the total tonnage handled during the previous biennium.

The falling off in tonnage naturally resulted in a decrease in the revenue produced by the port. The total revenue of the port for the previous biennium amounted to \$5,960,312.19, and for the last biennium \$5,314,411.93, a decrease of \$645,900.26, or 10.9 per cent.

In view of the decreased tonnage and revenues, it was imperative that the board institute operating economies in order to balance expenditure with revenues. Under a plan of retrenchment established by the board, the expense for administration, operation, and maintenance during the last biennium amounted to \$3,022,887.52, a decrease of \$381,851.81 under the expenses of the previous biennial period.

The net revenue for the biennium, after meeting all expenses of administration, operation, and maintenance, amounted to \$2,291,524.41. Additions to net revenue derived from premium on bonds sold and a fire loss adjustment, totalled \$9,925, and deduction from net revenue for bond interest and uncollectable accounts receivable amounted to \$1,434,574.57.

The current revenue surplus for the biennium amounted to \$866,874.84. Of this surplus an amount of \$483,663.60 was deposited in sinking funds created for the purpose of retiring the funded debt while the balance remains in deposit in the San Francisco Harbour Improvement Fund, which fund in

addition to financing the operating expenses of the port, is utilised as a depreciation fund for the replacement of worn out or obsolete structures.

At the close of the last biennium, June 30, 1934, the total funded debt of the port amounted to \$17,903,000, secured by physical properties with an appraised value of \$83,635,952.53. At the end of this biennium, the various sinking funds contained cash and securities in the amount of \$1,091,027.48, to be utilised for the retirement of the funded debt.

Capital expenditures for the two years' period totalled \$1,061,903.13, of which an amount of \$711,412.99, was financed from harbour revenues and \$350,490.14 from bond funds.

Recent Contracts Completed.

Major construction contracts commenced prior to July 1, 1932, and completed during this biennium, were as follows:

Extension of Pier No. 44 from 797 feet to 967 feet in length; the construction of a depressed railroad track on the north side of the pier; the conversion of the depressed track on the south side to a surface track, and the construction of three cargo aprons.

Construction of an open wharf 862 feet long on the south side of Islais Creek, east of and adjoining the grain terminal; construction of an additional elevator building and bins at the Islais Creek Grain Terminal, for the handling of bulk grain; the paving of Jefferson Street from Powell to Leavenworth.

The following major constructions and maintenance contracts were entered into and completed during the biennium:

Extension of Pier No. 35 to a length of 1,053 feet on the east side, and 895 feet on the west side; installation of extensive modern passenger accommodations, including first floor lobby baggage room, and second floor waiting rooms, and baggage inspection gallery; reversible belt conveyor for transferring baggage between the inspection gallery and the first floor; passenger elevator, adjustable cargo aprons and chutes, and additional offices and commissary space.

Construction of Unit No. 3 of the State Refrigeration Terminal, on the second floor of the State Terminal Building at China Basin. This unit extends over the remaining portion of the second floor of this building, and occupies a space 242 feet in length, and 100 feet in width. This contract also included extension of the engine room on the first floor of the building, and the installation of additional refrigeration machinery.

Installation of cargo aprons and cargo inclines on Piers Nos. 30, 32 and 46.

Extensive repairs to reinforced beams and girders on various piers.

Laying new roofing on the sheds of Piers Nos. 7 and 34, and on portions of the Ferry Building.

Paving of the roadway from Third Street and Arthur Avenue to the new Islais Creek Wharf.

Major construction contracts entered into during the biennium, but at present incomplete, include:

Additions to Wharf 47, at Fishermen's Lagoon, and the construction of two finger piers, one 613 feet in length, and the other 336 feet in length, to provide additional berthing space for fishing boats; and the extension of Pier No. 42, to approximately the same length as Pier No. 44—967 feet.

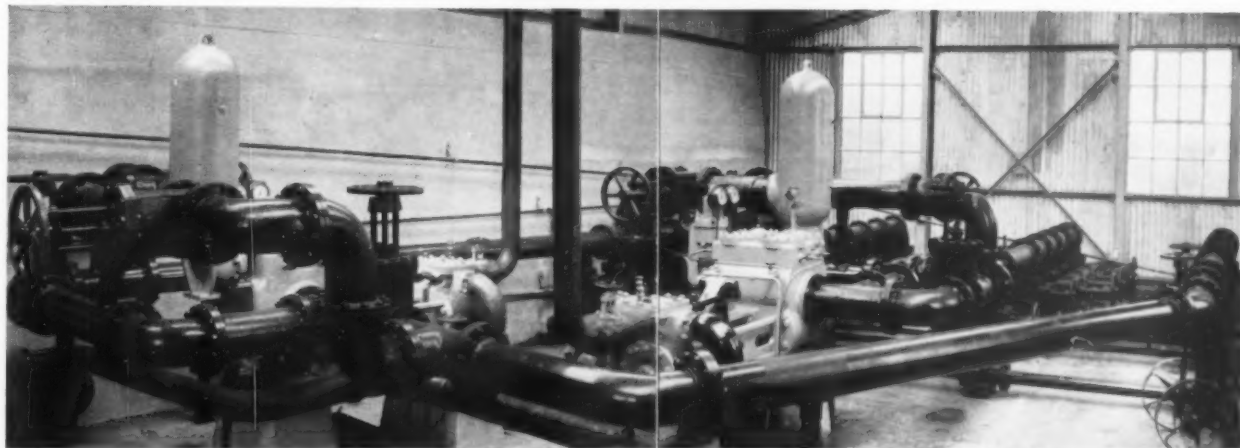
Cargo Loaded and Discharged.

Summary Statement Showing Tons of Freight Discharged and Loaded Over the State Wharves During the Forty-one Years From 1894 to 1935.

Year	Tons	Year	Tons
1894-1895	3,729,367	1905-1906	5,748,992
1895-1896	3,848,461	1906-1907	6,802,793
1896-1897	3,657,219	1907-1908	6,468,527
1897-1898	3,894,362	1908-1909	6,325,078
1898-1899	4,154,543	1909-1910	6,866,148
1899-1900	4,646,157	1910-1911	6,629,122
1900-1901	5,048,831	1911-1912	6,798,726
1901-1902	4,890,679	1912-1913	7,528,965
1902-1903	5,203,485	1913-1914	7,253,896
1903-1904	5,528,048	1914-1915	7,947,117
1904-1905	5,292,113	1915-1916	8,900,255
1916-1917	9,389,417
United States transport wharves, Western Sugar Refinery wharves, Bethlehem Shipbuilding Corporation and U.S. Steel Products Co. wharves	...	465,142	9,854,559
1917-1918	...	9,707,612	10,257,612
United States transport wharves, etc.	...	550,000	...
1918-1919	...	8,678,791	9,198,469
United States transport wharves, etc.	...	519,679	...
1919-1920	...	8,916,798	9,466,798
United States transport wharves, etc.	...	550,000	...
1920-1921	...	8,208,577	8,513,087
United States transport wharves, etc.	...	304,510	...
1921-1922	...	8,193,435	8,628,000
United States transport wharves, etc.	...	434,565	...
1922-1923	...	10,087,936	12,448,242
1923-1924	...	10,607,309	11,639,151
1924-1925	...	10,099,336	9,578,118
1925-1926	...	10,652,076	8,674,528
1926-1927	...	11,131,850	9,026,604
1927-1928	...	10,854,087	9,588,046
1928-1929*	...	11,639,971	...

*Includes tonnage of inbound inland waterway and coastwise cargo re-shipped which was not included prior to April, 1929.

Sunderland Corporation Quay : Oil Installation



View of Pumps and Manifold.



View from N.W. Corner showing mass wall and feed pipes to tanks.

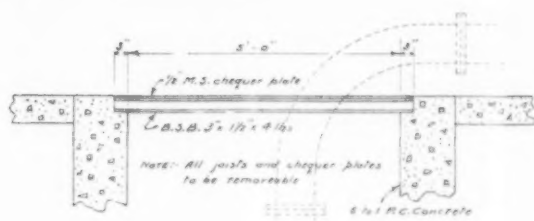
WITH the completion of the installation for the import and export of oils the works of Sunderland Corporation Quay are finished so far as is at present contemplated. Prior to the scheme being carried out there were oil supplies at several points in the port, but the Corporation's very complete installation has the marked advantage in common with the Corporation Quay itself, of being most readily accessible from the sea, indeed from the open sea to either of the supply points on the quay is only three-quarters of a mile. The installation is the property of Sanderland Corporation, is under the general management of the River Wear Commission (as is the Quay itself) and has been leased to Sunderland Oil Co. The scheme was prepared by Mr. W. H. S. Tripp, M.Inst.C.E., Engineer of the River Wear Commission, while the services of Mr. F. J. Rigg, M.Inst.C.E., were retained as consulting engineer in connection with the preparation of the specifications and plant and machinery. For the work the tender of the Whessoe Foundry & Engineering Co., Ltd., of Darlington was accepted, at an approximate figure of £17,600, and they were responsible for carrying out the entire scheme. The sub-contractor for the civil work was Messrs. Robert Hudson & Co., Ltd., of Sunderland.

The installation, as will be seen from the accompanying drawings, is in close proximity to the Quay. The plant consists of two main storage tanks each capable of containing 2,000 tons of oil, a mixing tank, and two service tanks, and these are situated in a walled yard, where also are placed the pumps and boiler house. This house is a steel-framed building, 50 feet long, 25 feet wide and is well adapted for the purpose for which it was designed. Two pipe lines run from the yard to the quay, the pipes being of seamless mild steel. There are two supply points to each pipe line. The pipes are so arranged that they will drain by gravity partially to a large sump near the pump-house, and partially to small sumps at the supply points on the quayside. The pumps are in duplicate and the



View from South-East Corner, showing Tanks and Pump House.

ENGINEER,

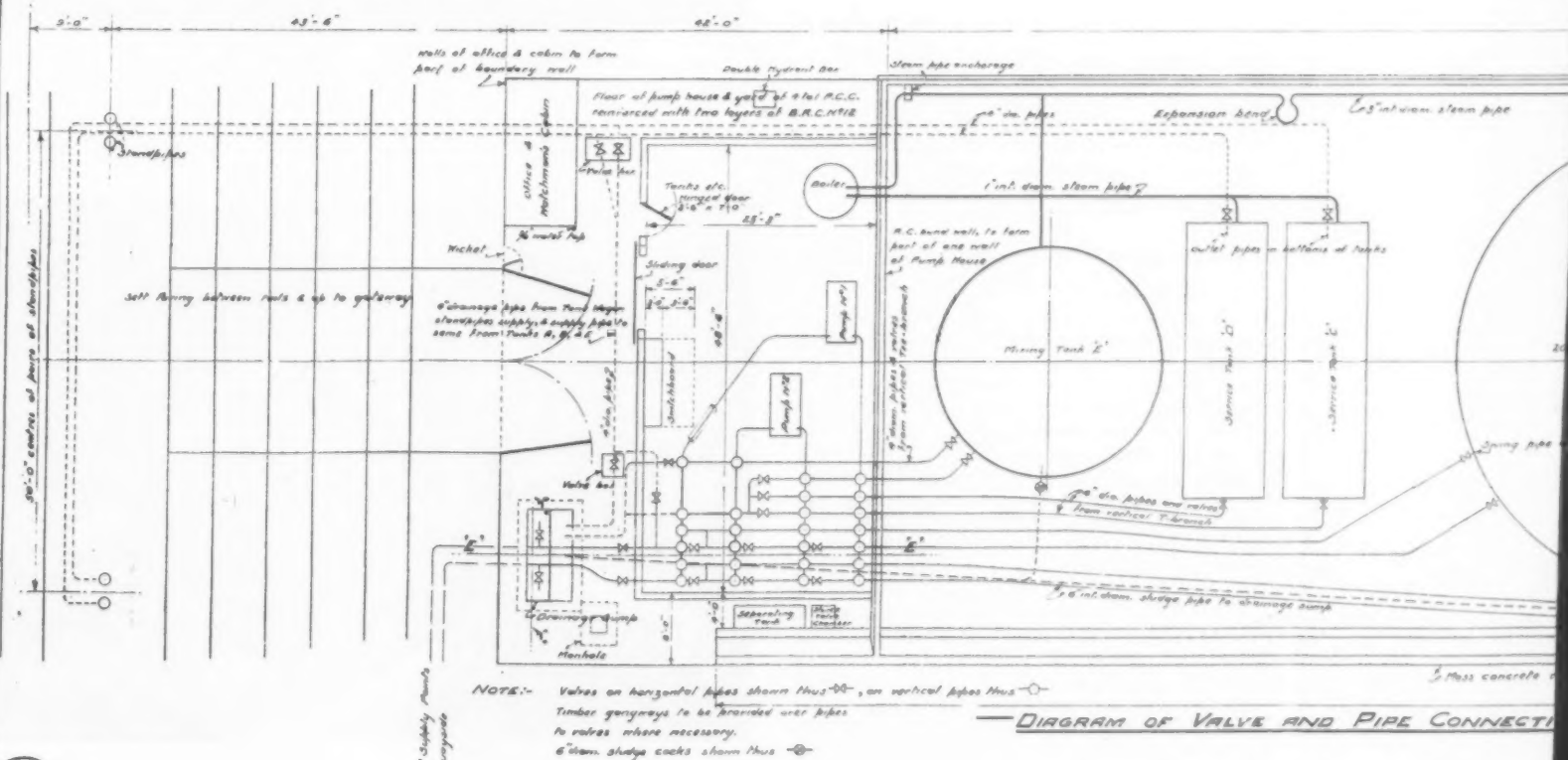


CROSS-SECTION

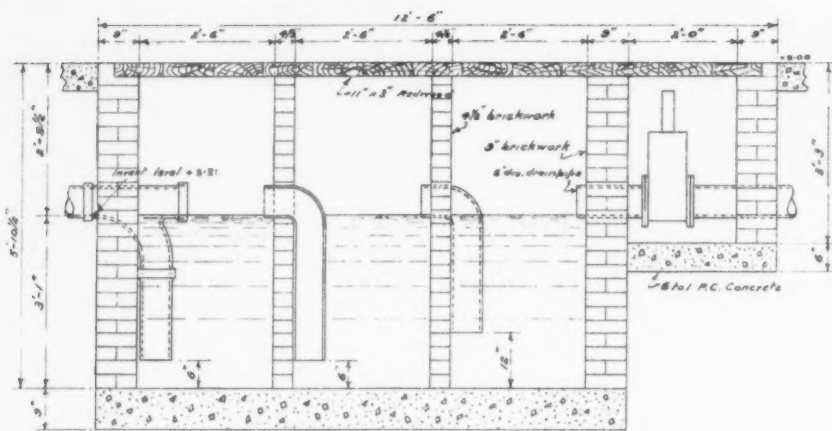
PLAN OF COVERING FOR DRAINAGE SUMP



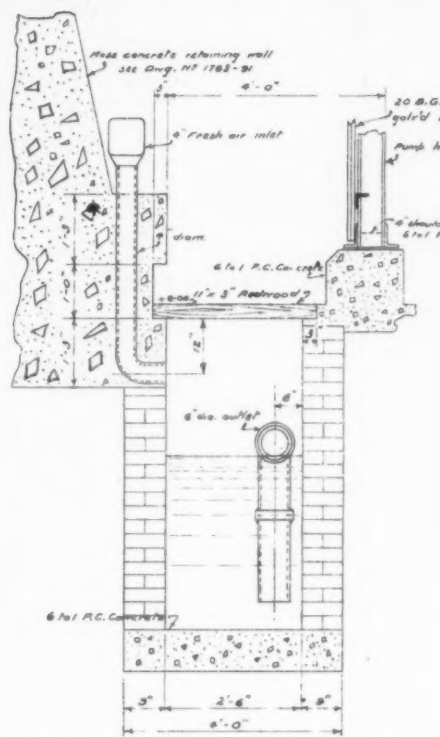
SECTIONAL ELEVATION F'-F'-



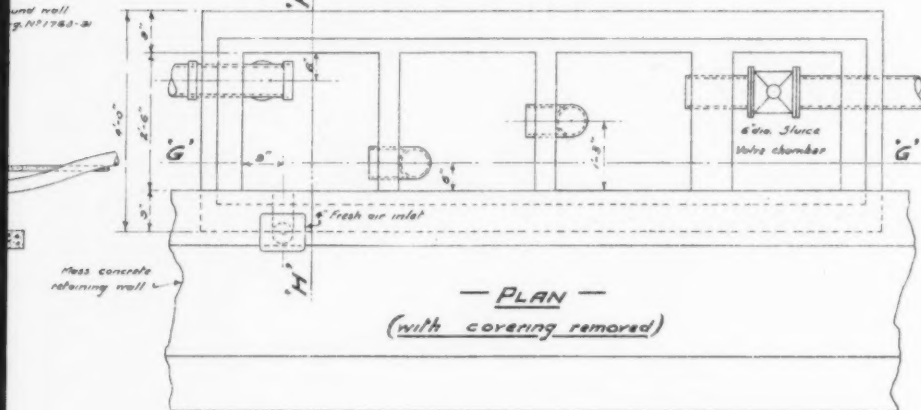
DETAILS OF PUMP FOUNDATIONS



SECTIONAL ELEVATION G'-G'

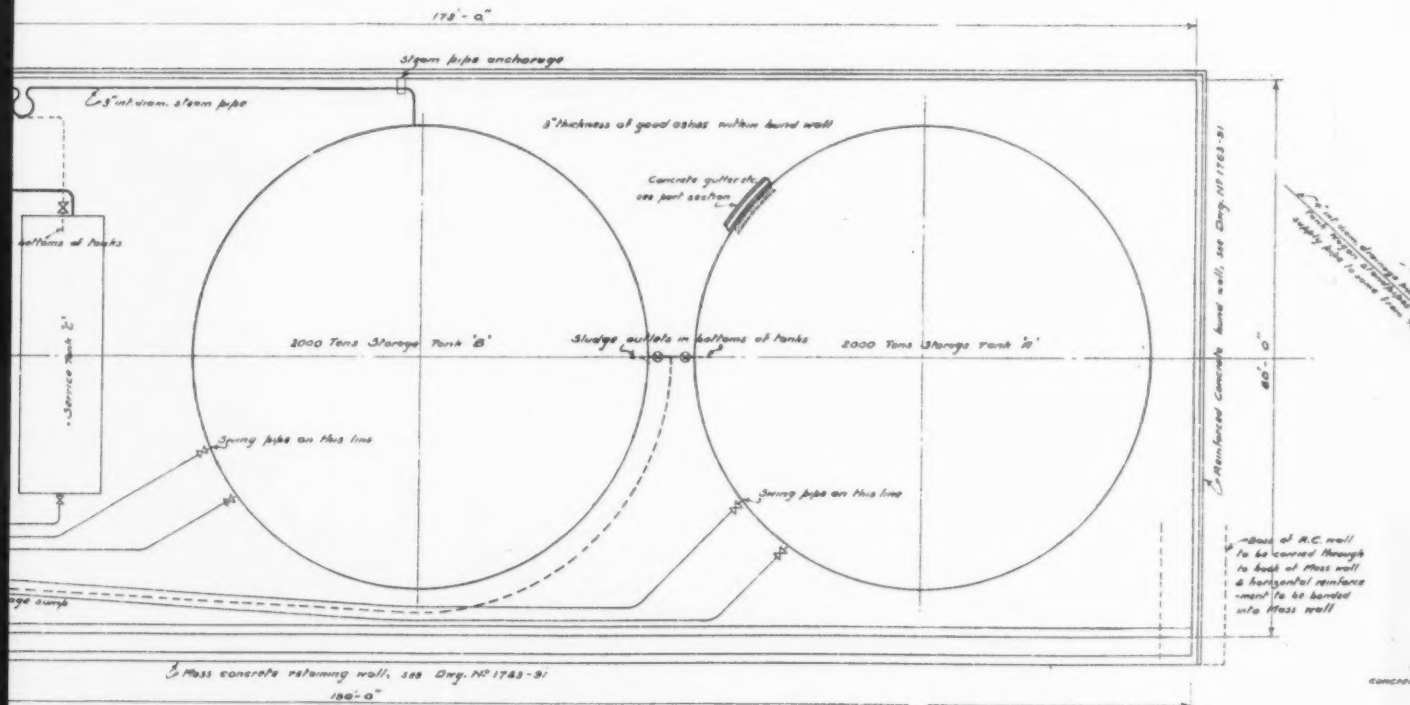


SECTIONAL ELEVATION H'-H'



— PLAN —
(with covering removed)

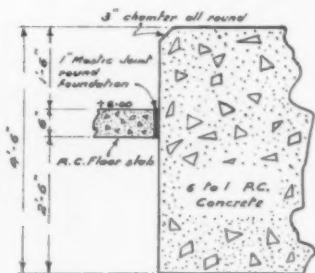
SEPARATING TANK —



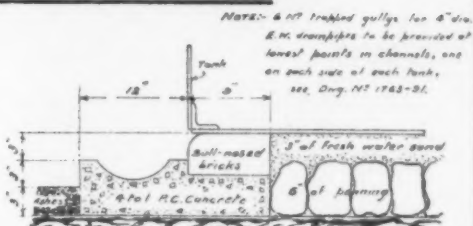
AND PIPE CONNECTIONS

DRAWING N^o 1763-96

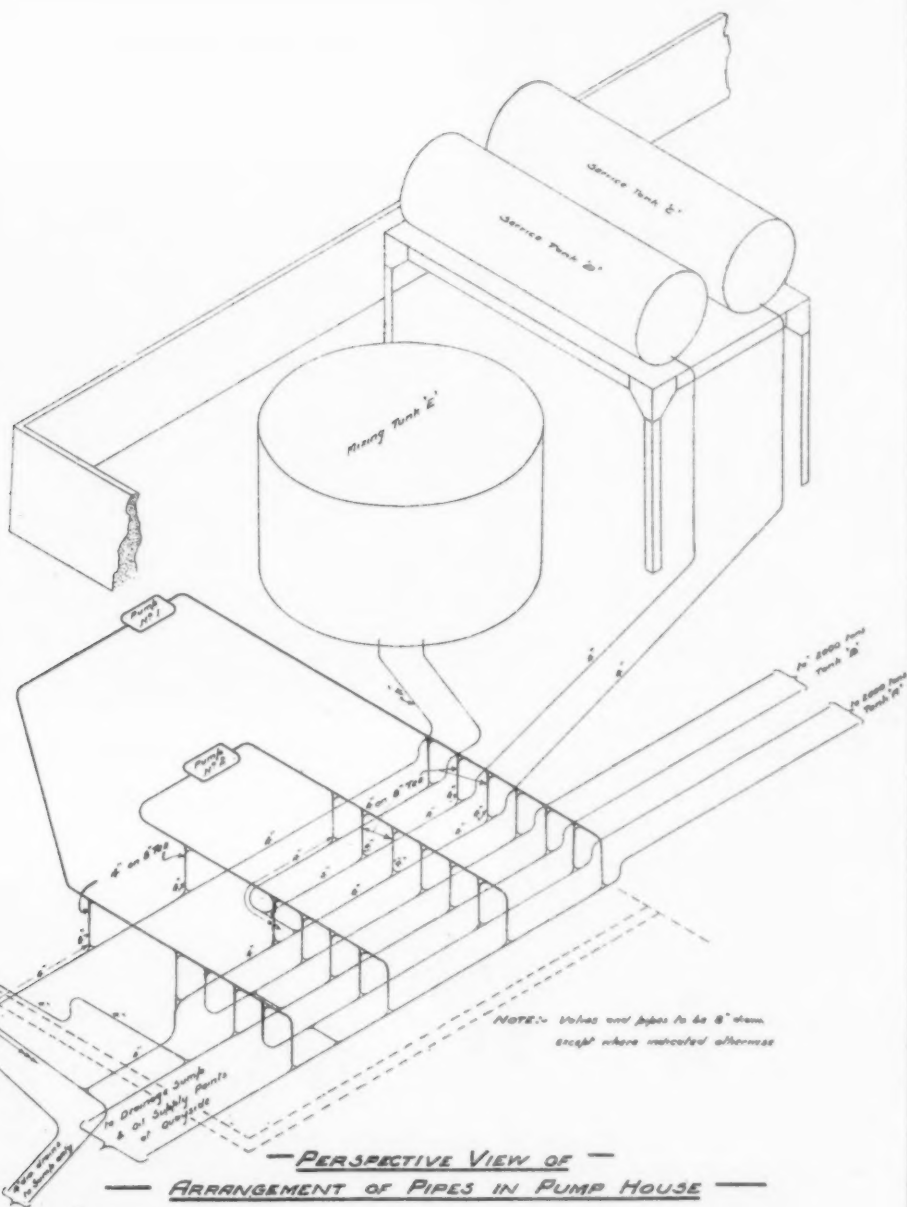
NOTE:- Sizes of foundation block in plan view are to suit pump



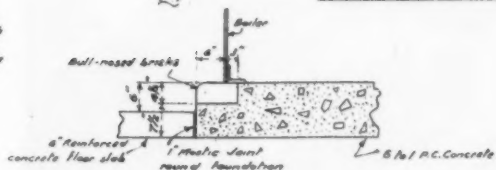
PUMP FOUNDATION BLOCK



PART SECTION OF FOUNDATIONS OF STORAGE & MIXING TANKS



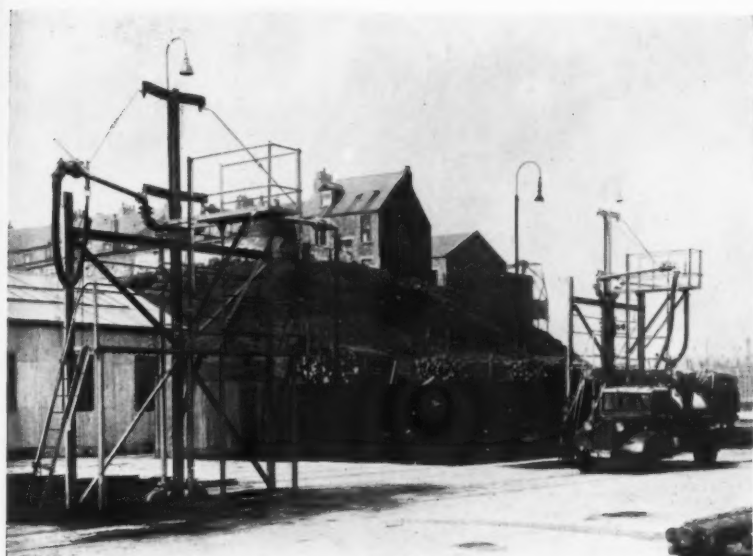
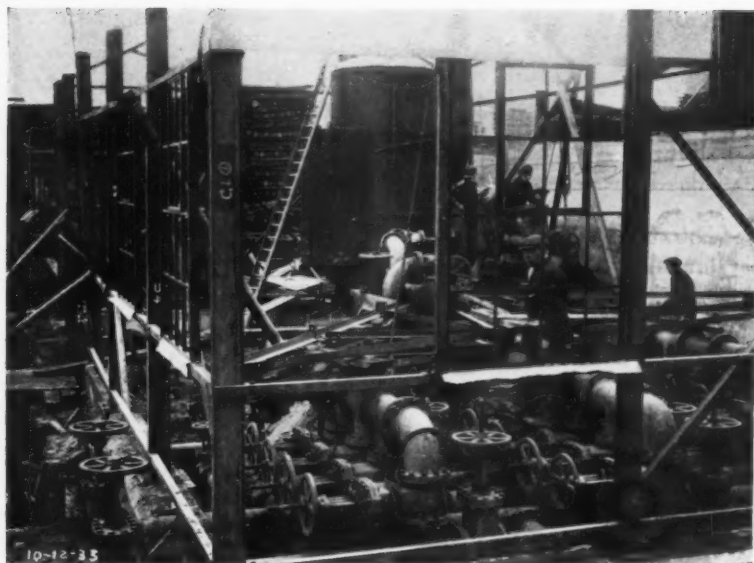
PERSPECTIVE VIEW OF ARRANGEMENT OF PIPES IN PUMP HOUSE



BOILER FOUNDATION

ENGINEER'S OFFICE,
SUNDERLAND, 6TH NOV., 1934.

W. S. L. P.
ENGINEER.

Sunderland Corporation Quay—continued*Stand Pipes showing loading arms.**View of Manifold Pipes, Valves, etc., in Pump House.**View showing Trench between Valve Pit No. 4 and Ramp Wall.
Also Oil Pipes in Trench and Puddled Clay.*

connections are so arranged that oil can be pumped by either pump in or out of any tank out of or into any other tank, and also from the large sump into either of the large tanks. Oil can be run either way between the Quay supply points and the large tanks without passing through the pumps, but the connections allow the pumps to act as boosting pumps to an incoming cargo as well as supply pumps to an out-going cargo. For road and rail supply two stand-pipes are provided in each of two positions.

The two vertical cylindrical storage tanks are of mild steel, each 50 feet in diameter, and 40 feet high. The mixing tank also is of mild steel 25 feet in diameter and 17 feet high. The two horizontal cylindrical service tanks are 30 feet long and 9 feet in diameter, elevated on a steel structure so that the bottoms of the tanks are 22 feet above the rail level at the stand-pipes. The oils dealt with are fuel oil, of a specific gravity of about .800 to .968 and gas oil of a specific gravity of about .840 to .880 and mixtures of these two oils. The pumps are driven by steam and are of the reversing pattern, and each is able to deal with either gas or fuel oil, and is capable of delivering 100 tons per hour, against a head of 100 feet at a pumping temperature of 75 degrees F. The pumps have connections with the large sump chamber and are capable of emptying it and delivering the oil to either of the large tanks. The boiler is of a vertical type, capable of evaporating 2,850 lbs. of water per hour from a temperature of 50 degrees F. under easy steaming conditions with a working pressure of 120 lbs. per square inch. Coils for steam heating are provided in one storage tank and in the mixing tank, and four heating elements in each elevated tank, and a coil is also fixed in the main sump. The coils in the 50 feet diameter tank are in two sections, containing in all 1,100 feet solid-drawn steel tube of 2 inches bore, and those in the mixing tank are of a similar character.

The oil installation is a distinct asset to the Corporation Quay, and as the efficiency of its equipment becomes more generally known, it is likely to be very largely utilised. Indeed, already in its comparatively short existence some 3,000 tons of oil have been dealt with—a good augury for the future.

Improvements at Hull Docks.

The London & North-Eastern Railway Company announce that they are about to equip several cranes at their King George and Alexandra Docks, Hull, with special "Barnard" grabs to facilitate the discharge of scrap metal. Similar grabs were recently installed at the Railway Company's West Hartlepool Docks.

Cruising Liner "Strathmore" at Avonmouth Docks.

Last year's successful experiment by the P. & O. Steam Ship Company in using Bristol as a port of embarkation was repeated again this year when on Friday, the 7th August, the latest addition to the fleet—the "Strathmore"—docked at Avonmouth. Returning from a cruise of the Mediterranean, she disembarked more than 1,000 passengers. The vessel was berthed at the Royal Edward Passenger Station berth, and after passing through the Customs the passengers left in three special trains running to London, the Midlands and North, and one for local destinations.

Shortly after the last passenger had disembarked the vessel moved to a berth in the Royal Edward Dock, where she was prepared and re-viceualled for a further cruise commencing on the following day. She sailed on the evening tide of Saturday, the 8th August, with considerably more than 1,000 passengers for another cruise of the Mediterranean.

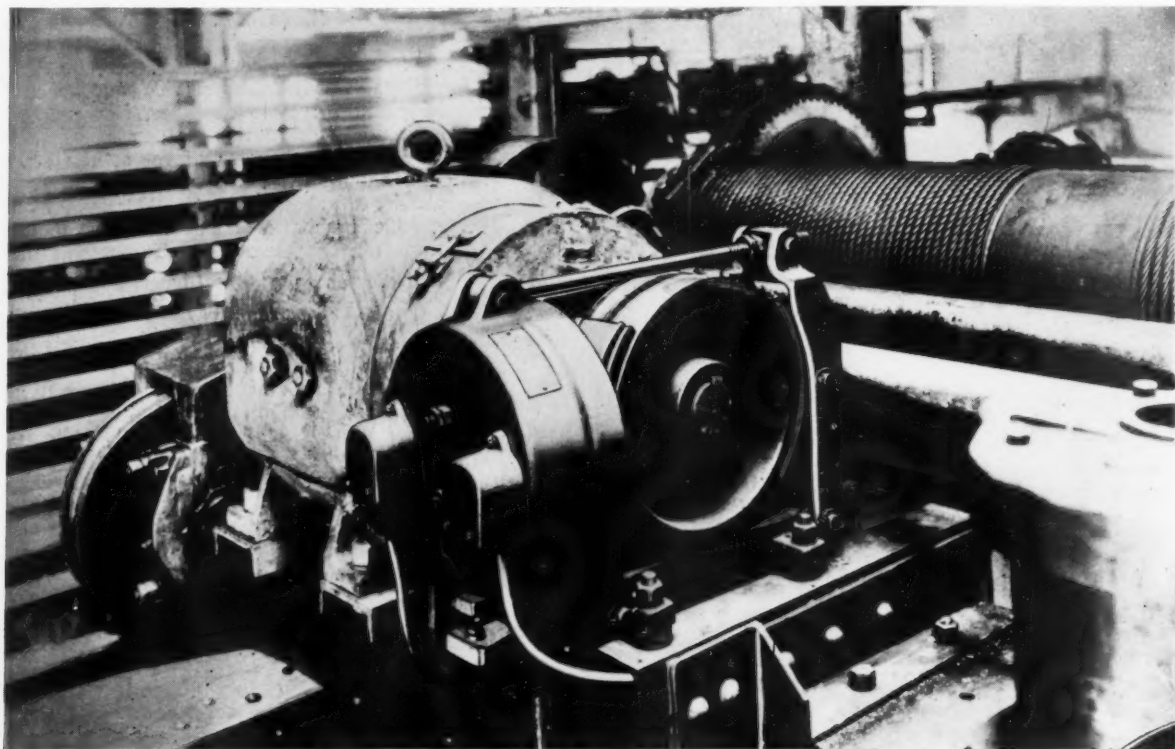
The vessel is 610 ft. long, has a gross tonnage of 23,428, and is the largest vessel yet built for the P. & O. fleet.

Electrically-operated Brakes

THERE are many applications in shipyards for a reliable brake for stopping heavy machinery rapidly and smoothly, such as on crane, hoist, and conveyor motors, which are often installed in exposed positions. For arduous work of this nature electrically-operated brakes, which are made for both direct current and alternating current service, have proved exceedingly efficient.

For direct current service, the arrangement of parts is such that the operating magnet acts directly on the brake shoes.

The one spring used in the construction is a heavy steel helical spring located in the centre of the magnet field. All structural members are pivoted and, in the released position, no pressure is transmitted to the pins. Because of the short stroke of the magnet the motion of any of the brake parts is very slight. The wear, except on brake linings, is infinitesimal. Practically the only inspection necessary is for the purpose of watching the wear on the brake linings and making an occasional adjustment therefore.



Electric Brake installed on Overhead Crane.

The magnet armature is an integral part of one of the brake shoe arms. The magnet field is connected to the opposite shoe arm by a rod which passes over the brake wheel. When the brake is applied, the armature and field are forced apart by the spring placed in the centre of the magnet field, and the brake shoe attached to the armature is forced against the wheel. At the same time the magnet field pulls the opposite shoe against the wheel.

In other words, each shoe moves the same distance and in exactly the same direction as does that part of the magnet to which it is attached. As the action and reaction of the armature and field are equal, equal forces are exerted on the two shoes.

The principal advantage of this design is the entire elimination of all the toggles, bell cranks, and levers ordinarily required to change the direction or amplitude of the actuating force. The action is direct; there is no lost motion, less friction, and less time lost in action.

The direct action between the operating magnet and the brake shoes makes the use of a short stroke magnet possible. The total movement between the armature and field need be only enough to provide sufficient clearance between the brake shoes and the wheel when the brake is released. The maximum magnet travel of this brake is not over $\frac{1}{4}$ in. or $\frac{1}{16}$ in. for each shoe. As a result the time required for application or release is very small—practically instantaneous. Moreover, the distance travelled is so short that there is no chance for bouncing on application or hammer blow on release.

On applying a brake of this type, there is a quick steady pressure, which brings the motor to rest in the shortest time consistent with safety. On release, there is no dragging of the brake shoes as the motor gets under way—no undue wear on the brake shoe linings. The absence of hammer blow also makes the release very quiet.

All working parts of the brake are made of heavy cast steel to ensure against breakage. There are no fragile parts, and nothing that is apt to get out of adjustment and cause faulty brake action. The brake wheel is built with a special hub construction, which eliminates heat strains and provides great strength in the keyway. The wheel flange is ribbed to provide additional ventilation.

By removing the one pin at the top of the magnet, the rod which connects the magnet to the opposite brake shoe arm may be lifted and the hinged arm swung back to permit the removal of the brake wheel and motor armature. And this is done without disturbing in any way the setting of the brake or the alignment between the brake and the motor. When the armature and brake wheel are replaced and the rod once more secured to the magnet by its pin, the brake is ready for use. The brake shoes can also be removed and replaced readily, because here again but one pin holds each shoe in place.

The magnet coil is made thoroughly weather-proof. The coil, after being impregnated by the vacuum process, is placed in the field casting and the space around the coil is filled with a water-proof insulating compound. An aluminium disc completes the enclosure of the winding and makes the magnet entirely weather-proof. Because of this construction, the brakes are used on outdoor cranes and hoists year in and year out without developing trouble. The insulation of coil windings permits their use on voltages up to 600.

The intensity of the braking force on the brake is regulated by varying the compression on the large spring in the centre of the field. The nuts, placed between the terminals at the back of the magnet case, are used for this purpose. Adjustment for wear on the brake shoe linings is made by changing the effective length of the rod above the brake wheel. The clearance between the brake shoes and the wheel is equalized at the time of installation and checked whenever the brake shoe linings are renewed by adjusting the stop located below the magnet case. All three adjustments are provided with suitable lock-nuts to ensure their permanence.

An advantage of this brake is that the particularly compact design permits its installation in almost any situation where a brake is necessary. While all dimensions are reduced to the minimum, the headroom necessary is especially low—just enough to provide for the rod which is located immediately above the brake wheel and which connects the magnet to the opposite brake shoe arm.

In order to mount such a brake on the ceiling or in an angular position up to 50 deg. from the horizontal, it is simply necessary to insert an additional screw in a tapped hole provided for that purpose in the base of the brake. For wall mounting with

Electrically-operated Brakes—continued

the magnet below the brake wheel, no change whatever is required. For wall mounting with the magnet placed above the brake wheel, a special equalising stop can be added at a slight additional cost.

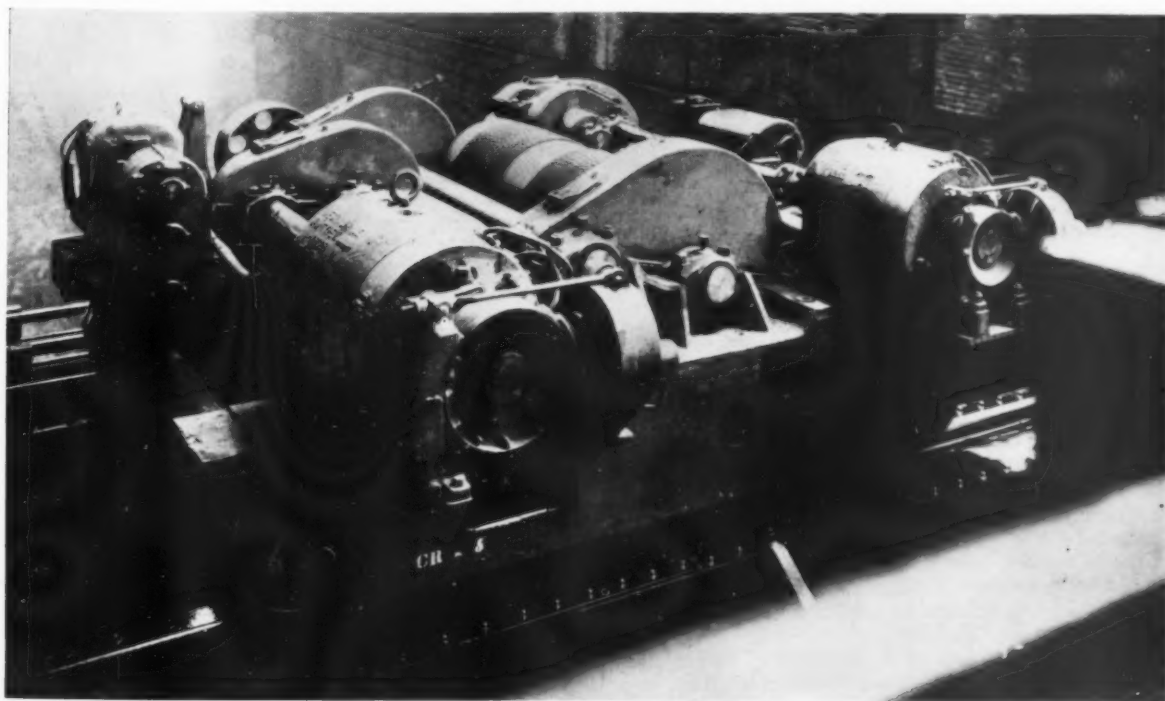
Brake magnets are series or shunt wound according to the requirements of the service for which the brakes are to be used. The action of series wound brakes depends directly upon the current taken by the driving motor. If the nature of the work is such that the brake action must be independent of the motor, a shunt wound brake is necessary.

Series wound brakes are made for either one-half or one hour duty. They will release at 40 per cent. of full load motor current when set for rated torque, and will remain released until the current drops below 10 per cent. When operated at rated

ism. With the rotating magnet there are no magnetically sealed contacts whatever and no danger that the brake will fail at some critical moment.

The design of these brakes is such that there is no mechanical contact between the reacting members. The rotor and stator of the rotating magnet replace the armature and field of the customary solenoid or clapper magnet. The characteristic slam with which the latter operates is in striking contrast with the quiet action of the rotating magnet.

The mechanism of alternating current brakes operated by solenoid or clapper magnets is sometimes immersed in oil to secure quiet operation. Such immersion materially increases the bulk of a brake installation and is apt to cause trouble and annoyance because of oil leakage. Brakes operated by rotating magnets



Direct Current Electric Brake on Overhead Travelling Crane.

duty, the temperature rise of series windings does not exceed 75 deg. C. by thermometer. Continuous duty series-wound brakes can also be supplied. They require 80 per cent. of full load motor current for release and have the same torque as continuous duty shunt-wound brakes. The temperature rise of continuous duty windings does not exceed 50 deg. C. by thermometer.

The brakes are shunt-wound for either intermittent or continuous duty. They will release at 80 per cent. of normal voltage when set for rated torque. Intermittent duty, as here used, means current "on" for one minute and "off" for one minute, or its equivalent. The longest continuous application of voltage should not exceed one-half hour. When operating under these conditions, the temperature rise of the intermittent duty windings does not exceed 75 deg. C. by thermometer. With full rated voltage applied continuously, the rise of the continuous duty windings is not over 50 deg. C. by thermometer.

Shunt-wound brakes, 1½-in. and larger, are supplied with a magnet coil designed for approximately one-half normal voltage. This coil is connected in series with a separately mounted resistor. By using this half-voltage coil, very quick release is assured and the brake shoes have no tendency to drag as the motor starts.

For alternating current service the electric brake is operated by a rotating magnet, equivalent to a high torque squirrel cage motor. For this reason it possesses unusual advantages. The adoption and development of the rotating magnet in place of the ordinary solenoid or clapper magnet has produced an alternating current brake whose reliability is unquestioned. The rotor operates through a pinion and a toothed sector to which a lever is attached. This lever spreads the brake arms and releases the brake shoes as the rotor revolves. It requires only one and one-half revolutions of the rotor to release the brake, after which it stalls and holds the brake in the released position until the control switch is opened. On applying the brake the heavy helical spring, placed above the rotating magnet, forces the brake shoes against the wheel, the small ball-bearing rotor offering no appreciable resistance. In brakes depending on solenoid or clapper magnet operation, there is a tendency particularly on light settings for the magnet to seal and hold the brake shoes away from the wheel, because of residual magnet-

ism. With the rotating magnet there are no magnetically sealed contacts whatever and no danger that the brake will fail at some critical moment.

Smooth steady application of brake pressure is secured by a special method of connecting the rotating magnet to the brake mechanism. The small rotor is so connected to the pinion that it acts as an inertia governor to ease the shoes on to the wheel, after which it overruns freely and does not affect the shoe pressure. No dashpot, which is liable to stick and get out of adjustment, is needed.

The rotating magnet on these brakes draws a practically constant current from the line. The amount is small. The smallest size requires only 200 apparent watts and the largest 2,000. This small current does not disturb conditions on the line. On the other hand, an alternating current solenoid or clapper magnet with its air gap varying from zero to 2-in., takes an excessively high inrush current. This inrush amounts to something like 2,000 apparent watts for a brake whose size is comparable with the smallest RS brake and 21,000 apparent watts for the size comparable with a 30-in. RS brake. Obviously such high current values cause line disturbances and introduce difficulties in the way of handling the currents.

Rotating magnet operation obviates still another difficulty that is inherent in the operation of alternating current magnets of the solenoid or clapper type. When this latter type of magnet fails to seal, the high current inrush continues; the result is a burned-out coil winding. Such failure to seal is liable to occur when the adjustment for wear of the brake linings is neglected. With an RS brake there is no high inrush current and the magnet winding is never in danger of being burned out from this cause.

The tension on the heavy steel spring, that draws the brake arms together can be varied to suit load conditions. Adjustment for wear is required only two or three times during the life of the brake shoe linings. This is easily effected by turning the nut on the thrust rod. Suitable back stops, for equalizing the shoe clearances, are provided at the base of each shoe. All these adjustments are made safe by locknuts.

These brakes will release, when set for full rated torque, at 80 per cent. of normal voltage impressed at the terminals of the rotating magnet. They can be supplied for either intermittent or continuous duty. The rotating magnets used on intermittent

Electrically-operated Brakes—continued

duty brakes are designed for one-half time duty; those used on continuous duty brakes will remain across the line continuously at rated voltages without over heating.

To select the correct size of brake for any particular installation, both the amount of retarding torque necessary and the area of the brake lining must be given consideration. It is customary to select a brake size which will give a retarding torque equal to the full load torque transmitted by the shaft to which the brake is to be applied. This torque can be obtained by using the well-known formula:

$$T = \frac{5252 \times \text{H.P.}}{\text{R.P.M.}}$$

T=torque in pounds feet.

H.P.=horsepower of driving motor.

R.P.M.=speed, in rev. per min., of shaft to which brake is to be applied.

The retarding torque of the brake selected should not be less than that obtained by this formula.

If the horsepower rating of the driving motor exceeds the limiting horsepower rating of the brake as indicated by the torque formula, then, in order to secure a sufficient area of brake lining to ensure maximum economy, the brake should be selected on the horsepower basis rather than by the formula. Moreover, the speed of the shaft to which the brake is attached should not exceed the maximum safe speed for which the brake is designed.

Some engineers, however, hold that one great disadvantage of brake-releasing electro-magnets is the abrupt braking they occasion, which puts considerable strain both on the brakes themselves and on the whole crane or winding gear and shortens the useful life of the equipment. Some A.C. brake releasing

magnets absorb a very strong current surge at the moment of circuit closing, and, for this reason, it is not possible to make the coils of these magnets absolutely defect-proof. If, when attracted, the magnet core is prevented from accomplishing its complete travel on account of too great a mechanical load opposed to it, or because the pull-rod has somehow become wedged, the heavy current surge persists, and the coils burn out. This often leads to service stoppages with their undesirable consequences.

The electro-hydraulic thruster works on a new principle and is claimed to be free from the above-mentioned drawbacks. This thruster is mainly composed of a centrifugal pump driven by a small motor. This pump drives oil under pistons which are, thus, displaced vertically upwards. This is, therefore, a lifting device driven by a small motor. The heavy current surges mentioned in connection with electro-magnets are eliminated here, and there is no difficulty in making the motor driving the centrifugal pumps absolutely reliable. If the electro-hydraulic thruster is mechanically overloaded, i.e. if it is called on to produce greater lifting work than that corresponding to its rating, the lifting pistons move more slowly or come to a stop; the centrifugal pump then simply churns the oil, but does not displace it, and there is no damaging overloading of the motor.

The electro-hydraulic thruster works quickly and smoothly without shocks. A regulating device which is operated simply, from without, can be so adjusted that the brake is quickly applied, as is necessary in hoists, in order to prevent the load falling. On the other hand, if big loading bridges are being stopped, braking must not be abrupt, but gradual. The hydro-electric thruster allows of setting the brake-application time over a considerable range. In every case the electric-hydraulic thruster works without shocks which preserves the whole plant, while reducing brake wear to the minimum.

Bombay Port Trust

At a meeting of the Trustees of the Port of Bombay held on 11th August, 1936, the Audited Accounts for the year ended 31st March, 1936, were approved for submission to Government; the Revenue surplus on General Account amounting to Rs.2.26 lakhs, will be transferred to the Revenue Reserve Fund, bringing the Fund to Rs.52½ lakhs.

The Board approved, subject to the sanction of Government, the proposal of the Consulting Engineers and Agents in London that Mr. C. G. DuCane, M. Inst. C. E., M. I. Mech. E., M. E. I. C., should fill the vacancy caused by the death of Mr. K. A. Wolfe Barry, O. B. E.

In pursuance of their decision to proceed as early as possible with the replacement of the steam-driven plant at Merewether Dry Dock which is worn out, the Board sanctioned an estimate for the work amounting to Rs.1.60 lakhs, and placed contracts for the supply of the necessary pumping machinery and accessories; by adopting electrically-driven pumps, an annual saving in maintenance of Rs.8,000 is estimated.

Subject to the sanction of Government, amendments of the Docks Scale of Rates were approved: (1) revising the rule relating to the method of computing storage "free days" in the Docks, with a view to placing goods assessable to Customs duty under the Sea Customs Act, but exempt under the tariff, on the same footing as goods on which duty is actually charged; (2) reducing the period of notice for cancellation of requisitions for the floating crane "Sarut" from 12 hours to 4 hours; and (3) revising certain wharfage rates either to regularise present practice or to rectify anomalies.

Priestman Excavators in the Federated Malay States.

A smart performance by a Priestman Tiger Dragline Excavator has been accomplished during the construction of an Irrigation Canal between the 2nd Stage Intake at Sungei Rembai Flood Relief Opening and the Tapah Road—Teluk Anson Railway Line near Sungei Batang Padang, Federated Malay States.

The work involved constructing a canal to the following dimensions:

Length. Lineal feet	...	9,000	3,700
Bed width in feet	...	5	3.5
Depth of water in feet	...	3	3
Hydraulic gradient	...	1/2000	1/2000
Velocity in feet per second	...	1.9	1.8
Discharge in cubic feet per second	...	46.8	35.8
Side Slopes. Inside Canal	...	1 to 1	1 to 1
Side Slopes. Outside Canal	...	1½ to 1	1½ to 1
Bank width on top in feet	...	6	6

The total excavation involved, including excavation on the line of the bed of the canal and from outside borrow pits, was 19,163 cubic yards. The line of the canal runs parallel with and five chains away from the river bund which was constructed by the Tiger Excavator and completed in September, 1935.

The soil consisted of light clay to a depth of 1 ft. to 2 ft. from the surface with fine slimy sand below. This type of sand slows up digging operations as it has a very high water content which reduces the amount of spoil lifted by the bucket.

The machine started digging on 10th October, 1935, and by 7th November, 1935, had travelled 11,100 feet along the line of the Canal. After deducting a loss of one day spent on deviating the machine round a deep pocket left by an old river channel the total length of 11,100 ft. was excavated in 26 days, an average of 427 lineal feet per day. Before the work was put in hand it was thought that the Tiger machine was rather large for the job but the experience has proved that it is of a type and capacity eminently suitable for such work on channels having a bottom width of 3 ft. or more. It is believed that this is the first occasion on which such a machine has been employed on work of this kind in the country.

Trimming and topping up will be done by hand labour and the rate of progress on this work can be much increased because of the drainage facilities given by the canal bed being already excavated.

Full Swing on the New Empire Boats from Hudson Bay.

A ship is on its way just now to Birkenhead with a Canadian cargo and an important mission.

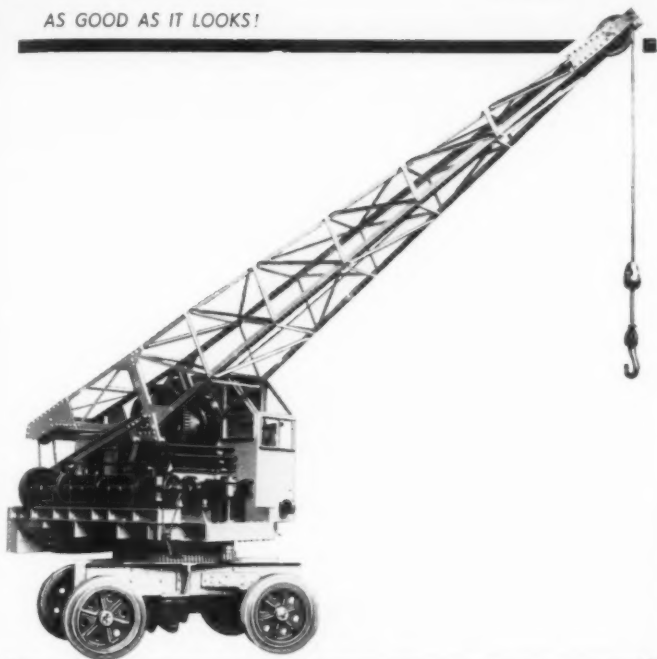
It is vindicating once more the faith of men like the Hon. C. A. Dunning, Canada's Minister of Finance, who, when Minister of Railways, encouraged the construction of a railroad to Port Churchill on Hudson Bay and opened up a new and shorter route between this country and the Prairies. It saves hundreds of miles.

At first British industrialists and underwriters looked askance at the idea of using for even a short season, a route which they believed to be dangerous. It had certainly its hazards, for ice floes are hard facts which the most ingenious apologist cannot quarrel with. But the Canadian Government equipped the entire route through the Bay with wireless beacons, direction finders and patrol ships and these, combined with the use of gyroscopic compasses, have made the route as safe as any. The insurance rates have been steadily reduced, and as the number of ships using the facilities of Churchill increased, the port took its natural place among the more promising shipping centres of the Empire.

The ship now reaching England is the first to make the double journey this season.

As conditions in the Prairies improve and the purchasing power of their citizens increases, the Hudson Bay route will prosper more and more, for the people of the West are eager to buy British goods.

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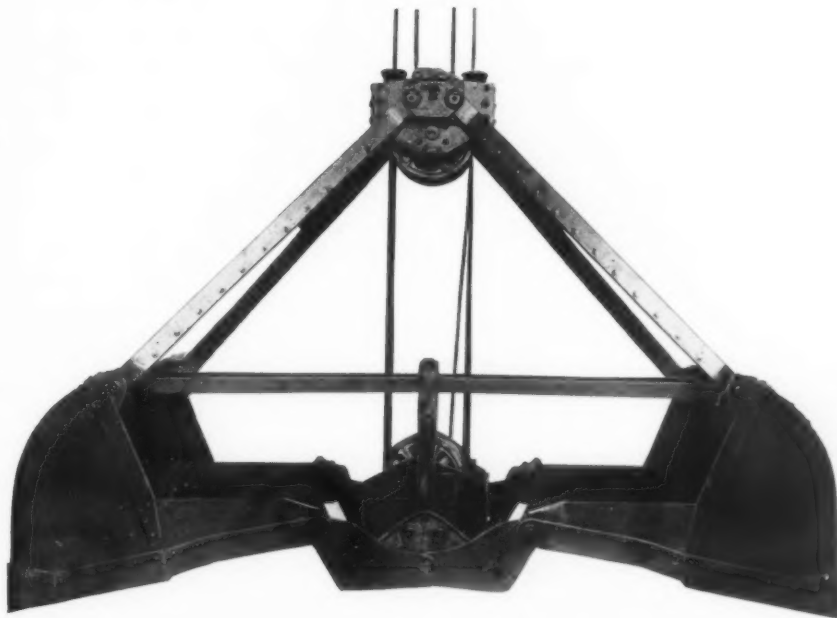
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Hull and the East Coast

L. & N.E.Rly. Appointments.

Mr. C. M. Jenkin-Jones, who has been appointed to succeed Mr. Thomas Hornsby as Divisional General Manager of the North Eastern area of the London & North Eastern Railway, has under his authority the docks belonging to the Company. Among the posts relating to docks held by him are the following: Chairman of the Conciliation Committee of the National Council of Port Labour Employers; Vice-president of the North-East Coast Council of Port Labour Employers; member of the Council of the National Confederation of Employers' Organisations, and member of the Standing Advisory Committee on Docks Employment. Mr. Jenkin-Jones represented British dock interests at the International Labour Conference at Geneva in 1928, 1929 and 1932. Since he joined the staff of the old North Eastern Railway at Hull in 1908 he has held various appointments with the Company (now merged in the London & North Eastern Railway undertaking) and has had a wide experience of dock and railway work. Mr. Thomas Hornsby, who has resigned to become Chairman of the Durham Coal Sales Committee, has had a long and intimate association with the commercial life of Hull, and in negotiations with representatives of the Hull Corporation and of shipping and business interests has always shown a readiness to promote the welfare of the port in which his Company have such extensive financial undertakings. He has been directly associated with many important dock and railway developments in recent years.

Mr. Charles H. Nicholson, A.M.I.Mech.E., A.M.I.E.E., relinquished the post of mechanical and electrical engineer at Grimsby and Immingham Docks on August 8th, in order to become district docks machinery engineer at Hull Docks in succession to Mr. W. T. Athey, who has retired. Mr. Nicholson began his career with the old Hull & Barnsley Railway & Dock Company and at the time of the amalgamation with the North Eastern Railway Company was chief electrical engineer.

On the amalgamation he was appointed assistant mechanical engineer at Hull Docks, an appointment which he continued to hold when a further merger took place and the London & North Eastern Railway Company came into existence. In 1930 a reorganisation of the dock working at Grimsby and Immingham took place and the then mechanical section of the docks engineer's department and the electrical department were merged. In May of that year Mr. Nicholson was appointed mechanical engineer for Grimsby and Immingham and during the six years he was concerned in the important and remarkable changes in the facilities of the two ports.

Treasury Grant for Dredging at Bridlington Harbour.

At the quarterly meeting of the Bridlington (East Yorkshire) Harbour Commissioners, Dr. T. C. Jackson (Chairman) presiding, it was reported that the Treasury, in response to the application of the Commissioners, had promised a grant of £1,000 towards the cost of completing the dredging of the harbour. The grant is to be paid in two instalments of £500 each, spread over two years. The work will be done under the supervision of the Ministry of Agriculture and Fisheries. Since its acquisition a year or so ago the dredger has removed approximately 120,000 tons of material from the harbour and at least an equal quantity has yet to be dredged. Mr. S. Charlesworth (Chairman of the Works Committee) stated that for the present they had had to lay up the dredger because the harbour was so busy now in the summer season that it would be impossible for it to work without interfering with the people who make such good use of the harbour. In addition, the Committee had a report from the insurance company to the effect that the boiler must be replaced or alternatively some very extensive repairs done. During the quarter, part of Langdale's Wharf had been re-surfaced at a cost of £54 and a tender had been accepted for new landing steps at the fish jetty.

The Port of Amsterdam

The position of the Port of Amsterdam in regard to number of vessels and tonnage and to goods traffic arrived and sailed, as compared with the corresponding figures of last year, is as follows:—

SEAGOING VESSELS AND TONNAGE.

	ARRIVALS				SAILINGS			
	No.	Per Cent.	N.R.T.	Per Cent.	No.	Per Cent.	N.R.T.	Per Cent.
July 1935 ...	247		336,061		250		343,960	
" 1936 ...	252		347,207		259		374,069	
	+5	+2.02	+11,146	+3.32	+9	+3.6	+30,109	+8.75
June 1936 ...	254		367,062		246		330,494	
July 1936 ...	252		347,207		259		374,069	
	-2	-0.79	-19,855	-5.41	+13	+5.28	+43,575	+13.18
Jan.-July 1935	1,672		2,475,945		1,679		2,495,485	
" 1936	1,718		2,455,687		1,715		2,441,124	
	+46	+2.75	-20,258	-0.82	+36	+2.14	-54,361	-2.18

SEAGOING GOODS TRAFFIC. (In Tons of 1000 Kilos*).

	1 Import		2 Transit incl. in col. 1		3 Export		4 Transit incl. in col. 3		5 Total col. 1 & 3	
June 1935 ...	259,526		48,521		117,625		52,365		377,151	
" 1936 ...	265,504		54,334		114,708		61,197		380,212	
	+5,978		+5,813		-2,917		+8,832		+3,061	
	+2.3%		+11.98%		-2.48%		+16.87%		+0.81%	
May 1936 ...	228,079		75,109		121,902		62,294		349,581	
June 1936 ...	265,504		54,334		114,708		61,197		380,212	
	+37,425		-20,775		-7,194		-1,097		+30,231	
	+16.41%		-27.66%		-5.9%		-1.76%		+8.64%	
Jan.-June 1935	1,622,638		353,152		838,113		364,037		2,460,811	
" 1936	1,500,314		354,469		856,758		385,294		2,357,072	
	-122,324		-3,683		+18,645		+21,257		-103,729	
	-7.51%		-1.03%		+2.22%		+5.84%		-4.22%	

* These figures have been taken from the monthly statistics of the Central Bureau, The Hague, Holland.

Classified according to flag the number of vessels which entered the Port of Amsterdam during July, 1936, was:—

Netherlands, 129; Great Britain, 50; German, 14; Swedish, 20; Norwegian, 17; Danish, 3; French, 4; Greek, 5; Lettish, 2; Finnish, 1; Polish, 2; Italian, 1; Estonian, 1; Belgian, 1; Jugo-Slavian, 1; Russian, 2.

Vessels laid-up at Amsterdam:—1st July, 1936—5 vessels, measuring 18,169 tons gross; 1st August, 1935—16 vessels, measuring 86,830 tons gross; 1st August, 1936—5 vessels, measuring 18,609 tons gross.

Bombay Port Trust

At a meeting of the Trustees of the Port of Bombay held on 28th July, 1936, the Board acceded to a joint representation from the Oil Companies, subject to the sanction of Government to the necessary amendment of the Port Rules, to forego the Indemnity Bond which the Port Rules require to be furnished by tank vessels employing their own steam for discharging oil. The use of a vessel's own power for pumping accelerates the speed of discharge, and is now universal practice; unlimited indemnification of the Port Authority against loss or damage practically rendered the facility inoperative.

Imports and exports at the Port of Bombay:—

Quarter ended	1935-36			1936-37		
	Import Tons	Export Tons	Total Tons	Import Tons	Export Tons	Total Tons
June Docks ...	458,540	449,595	908,135	422,314	527,564	949,878
" (overside and trans-shipment) ...	42,891	50,276	93,167	49,642	75,281	124,923
Bundars ...	304,140	74,968	379,108	302,618	64,050	366,668
Total ...	805,571	574,839	1,380,410	774,574	666,895	1,441,469

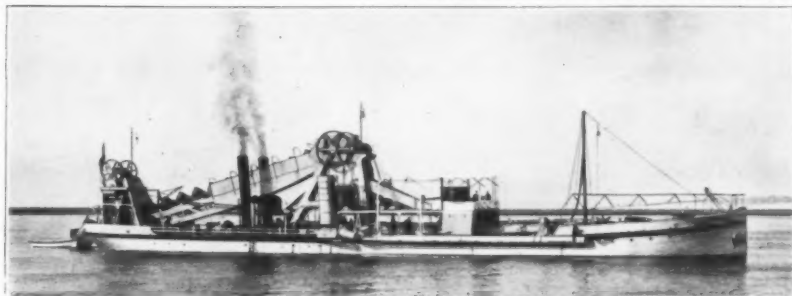
Vessels other than ferry steamers, hired transports, Government vessels and country craft, which entered the Port of Bombay:—

Quarter ended	1935-36		1936-37	
	No.	Net register tonnage.	No.	Net register tonnage.
Vessels engaged in foreign trade ...	225	985,059	220	950,084
Vessels engaged in coasting trade ...	561	547,967	662	578,551
Total ...	786	1,533,026	882	1,528,635

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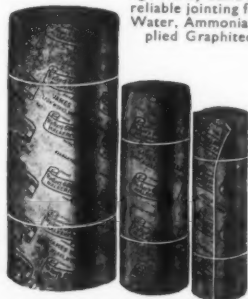
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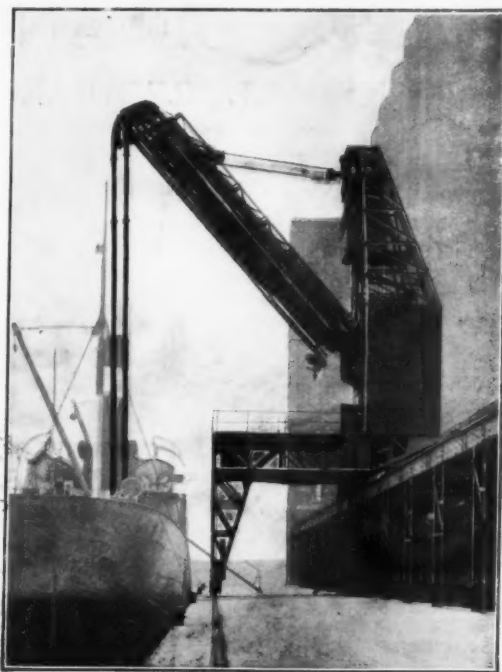
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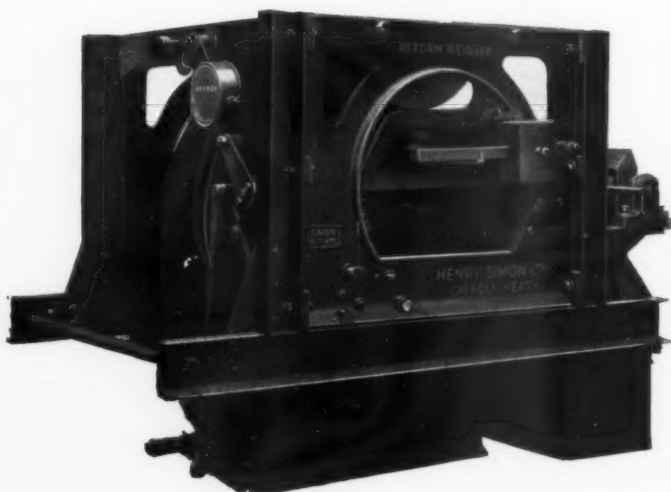
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